



**Arizona Department of Transportation**  
**Intermodal Transportation Division**  
206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janet Napolitano  
Governor

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Director

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**SCOPE OF WORK**

Scope Date: (Scope Date)

R/W Project No. : «RW\_Tracs\_No»  
Federal ID No. : «RW\_Federal\_Id\_No»  
Highway Name : «Highway\_Name»  
Section Name : «Section\_Name»  
County : «County»  
District : «District»

**GENERAL INFORMATION:**

All tasks and deliverable products associated with this project will be developed according to the instructions and policies contained herein, and, according to the standards and policies governing CADD drawings, plan sheet content and interim policies set forth on the ADOT R/W Plans Section website address below.

<http://www.azdot.gov/highways/row/rowplans>

The Drawing Number for this Right of Way Plans Project is «Drawing\_No». The Bid Advertisement date for Construction Project Const TRACS # is «Bid\_Date». The Federal Construction ID number is «Const\_Fed\_Id\_No».

**PROJECT TEAM:**

The Right of Way Plans Section Coordinator/Reviewer is     at (602) 712-   , who will assist in the development of the Project. The Right of Way Project Management Section Coordinator is     at (602) 712-   . The ADOT Project Manager is                      at ( )                     .

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**Task: RIGHT OF WAY SURVEY**

- A. Consultant shall perform a field survey and produce a Results of Survey Drawing which will be utilized in the development of the Right of Way Plans. The Survey will conform to "Finalized Right of Way Acquisition Process Plans Preparation" document dated July 27, 2000, approved

by the Arizona State Board of Technical Registration and adopted by the ADOT Right of Way Plans Section.

It shall be the decision of the ADOT Right of Way Plans Section and the Consultant as to which corners of the Public Lands Survey are needed in connection with the Project. The field survey shall consist of the location of Section Corners, Quarter Corners including the Center Quarter Corner, and other monuments set by the Survey of the Public Lands. Obliterated corners shall be identified, re-established, and re-monumented. Corners deemed to be "lost" shall be identified, re-established, and re-monumented as specified in the "Manual of Instructions for the Survey of the Public Lands of the United States" in force at the time of the Original Survey. As directed by the ADOT R/W Plans Section the Consultant shall locate canal and railroad right of way monuments, as well as major and minor street centerline monumentation. Existing Highway Right of Way, Survey, and As-Built Centerline Monumentation for the Project shall be tied to the Survey.

The monumented corners of platted subdivisions that lie on the existing ADOT right of way lines shall be tied. A reasonable field search will be made for monumented corners that lie on the existing highway right of way lines of any privately owned, adjoining non-platted parcels. These monumented parcel corners will also be located and shown on the survey.

With regard to the Center Quarter Corner, it shall be the decision of the ADOT RW Plans Section which sections shall require the establishment of the Center Quarter Corner. "Establishment" shall be construed to mean that either 1) a found monument at this position is located and accepted, or that 2) Consultant shall determine the position of this Corner from all available evidence and shall show the calculated position on the Results of Survey. Monumentation of the Center Quarter Corner will be at the discretion of the ADOT R/W Plans Section and the Consultant.

The Results of Survey Drawing shall be a representation of the field survey. Sectional boundaries shall be shown conforming to ADOT Right of Way Plans CADD Standards for linestyles, patterns, cells, and levels. Bearings and distances along surveyed/established section lines and mid-section lines shall be shown with distance ties to their intersection with the Centerline of the Existing Highway Right of Way. All monuments tied to the survey shall be shown by symbol and point number. The Results of Survey shall contain a Table of Coordinates listing the Point Number, Northing, Easting, and Description of the monument. The Description field shall contain a detailed description of the monument tied, including, but not limited to, a description of the type of monument and any markings such as stampings or tag numbers. The Centerline of the Existing Highway Right of Way shall be shown along with Curve Data Cells. Bearing and distance data shall be shown on tangent sections. Local tangent bearings (LTB's) will be shown for all centerline control points along any type of curve, where and when the control point is non-tangent. Coordinate data of all Centerlines shall be included. The existing right of way lines will also be shown. Coordinate points will be shown at each controlling corner on the existing right of way lines, as well as at the intersections of the existing r/w lines and surveyed section lines, mid-section lines and platted subdivision lines. The Consultant will also show the linework and label of any existing permanent easements (DE's, SE's, etc) that ADOT is the owner of. The Consultant will add a statement(s) that will indicate what station(s) were held as the basis of stationing of the centerline, as well as cite the record R/W plan or document that the controlling station is from.

The Consultant may add any additional information which, in his opinion, facilitates retracement by another surveyor. Once the R/W Survey drawing is accepted and filed in the

File Room of the ADOT R/W Plans Section, the Consultant will have satisfied statutory recording requirements. However, the Consultant is encouraged to also record the R/W Survey drawing at the local County Recorder's Office.

If directed by the R/W Plans Section, the Results of Survey will show and label any pertinent Federal, State, County, Reservation, Land Grant, and Municipal Boundaries, when those boundaries may have an impact on the location of the existing right of way.

After the Consultant has:

- a) completed the field portion of the survey,
  - b) performed preliminary centerline alignment calculations,
  - c) developed a general methodology and framework of how they will calculate and solve the corridor, and
  - d) before they have commenced with the production of the Results of Survey drawing,
- a meeting will be held between the Consultant and the R/W Plans Section. The Consultant will go over the monumentation and evidence that was found, and outline the methodology they plan to use to calculate and derive the existing R/W alignment. Examples would be what record station(s) will be held, if they intend on not holding record degree of curvature for any curves, use of any stations equations, if they will reject any monuments in the analysis, etc. At this time, the Consultant will also indicate any sectional corners that may not have been found during the field portion of the survey.

The Consultant will calculate the existing right of way corridor according to the current ADOT R/W Plans Section's "Right of Way Corridor Survey & Analysis Guidelines".

If the existing R/W report is available in a timely manner, its enclosed documentation and intent thereof shall be held and will also be compared to the existing R/W shown on the available R/W maps and plans. If there is a discrepancy between the existing R/W report documentation and the R/W maps/plans, the documentation will be held and the discrepancy will be relayed to the R/W Plans Section.

If the existing R/W report is not available in a timely manner, the existing R/W maps and plans will be used to calculate the existing right of way and shown on the Results of Survey. The Results of Survey will be considered preliminary. After the existing right of way report is received, the documentation will be reviewed and compared to the preliminary results and any necessary revisions will be made to the Results of Survey and relayed to the R/W Plans Section.

Unless otherwise specified by the ADOT Right of Way Plans Section, the following shall apply: the basis of coordinates shall be the North American Datum (NAD) 1983/92 definition with a scale origin point of 0,0 ; NAD83/92 coordinates listed shall be ground coordinates; bearings shall be grid bearings; the Grid Factor, as specified by ADOT Photogrammetry and Mapping Section project no. \_\_\_\_\_, (or as derived by the Consultant using local NGS control stations) shall be applied. The Results of Survey should clearly state the basis of coordinates, the basis of stationing, list any ADOT or NGS Control Points used to control the Survey, and the Grid Factor that was used.

The Consultant will be required to contact the ADOT District of the project area and if required, obtain a permit from the District, before any field work within the existing highway right of way commences.

To properly execute the Right of Way Survey, it is typically necessary that the Consultant must enter onto properties that are adjacent to or in proximity to the highway. Before entering any non-ADOT owned properties adjacent to or near the highway, the Consultant is required to make every reasonable effort to give oral or written notice to the owners of said properties, pursuant to ARS 33-104.

In the execution of the Right of Way Survey, the Consultant will comply with all applicable State statutes and all applicable standards of the current Arizona Boundary Survey Minimum Standards.

The current Standard ADOT Right of Way Plans Sheet Border and cell library shall be used.

Calculated information shall be compiled in a Calculation Book as outlined under Initial Review, below.

### **Project Specific Information:**

This area of the scope would typically include items specific to this Task such as the following: A listing of the Sectional Corners that are to be located and/or re-established; any side street right of ways that need to be surveyed and defined; railroads or other boundary related features that are to be located; basis of coordinates; where to begin and end the r/w corridor survey; what existing centerline(s) need to be analyzed and shown on the Results of Survey; any anticipated special or unusual problems or cadastral situations, etc.

The Consultant will locate/establish/set the following sectional corners:

#### **T?(N,S) – R?(E,W)**

Section ? – SE cor., E.1/4 cor. and S.1/4 cor.

Section ? – N.1/4 cor. and W.1/4 cor.

The (north, south, east, west) end of the R/W corridor that is to be surveyed, analyzed and shown on the Results of Survey is at ?? centerline Sta. ???? as shown on R/W plans/strip map ??????.

The (north, south, east, west) end of the R/W corridor that is to be surveyed, analyzed and shown on the Results of Survey is at ?? centerline Sta. ???? as shown on R/W plans/strip map ??????.

The Consultant will survey and establish the existing R/W for side street name for an approximate distance of ??? feet, ???erly of ????

The Consultant shall contact the "County name" County Surveyor, "County Surveyor's name" at "phone number" as part of the research of this project.

The "District name" District Permits Supervisor is "District Permit's Supervisor's name" at "phone number".

### **The Consultant shall:**

1. Perform a field survey as outlined above
  2. Prepare a Results of Survey Drawing at a suggested scale of 1" = \_\_\_\_\_. It is estimated that a total of \_\_\_\_\_ sheets will be produced. A cover sheet is not being requested at this time. The Results of Survey will be sealed by an Arizona Registered Land Surveyor. Final mylars shall be trimmed to 22"x34".
  3. Prepare a Calculation Book as outlined below.
- B.** The following items are typical records that are necessary to be researched and obtained in the preparation of this task:
1. ADOT RW Strip Maps
  2. ADOT RW Plans
  3. ADOT As-Built Construction Plans
  4. ADOT County R/W Location Maps
  5. Survey Control Point Data Sheets (NGS and/or ADOT Photogrammetry & Mapping and/or other pertinent govt. agency)
  6. Existing R/W report
  7. GLO/BLM Township Plats and field notes / BLM Master Title Plat(s)
  8. USGS Quad Maps
  9. Project folders of previous ADOT projects within the area
  10. Existing Mapping
  11. Recorded Surveys and Subdivision Plats
  12. Unrecorded surveys, when known and/or available
  13. Preliminary search coordinates of sectional corners from recognized databases/sources
  14. Assessor's Maps
  15. Railroad R/W Maps (when applicable)
  16. ADOT Milepost Maps
  17. BLM protracted section maps, if project area is in an area that is unsurveyed by the BLM
  18. If in the metro Phoenix area, MCDOT GDACS surveys

## REVIEWS:

REVIEW TIME FOR THE INITIAL REVIEW WILL BE FIFTEEN (15) WORKING DAYS

### **A. INITIAL REVIEW** **DUE BY, \_\_\_\_\_**

1. The Results of Survey Drawing and Survey Calculations shall be submitted for review when all phases of work have been accomplished. The Results of Survey shall be submitted to ADOT RW Plans for review after Consultant has completed a Quality Assurance check on the all aspects of the Task. Surveys submitted for review which indicate that such a Quality Assurance Review has not been performed will be returned unreviewed to Consultant for correction.
2. The following items shall be submitted for use in conducting the Review:
  - a. One (1) half-size print of the Results of Survey to be used as check prints.
  - b. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using

**commas as delimiters.** Consultant shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by the ADOT Right of Way Plans Section. **Only numeric point numbers will be accepted.**

- c. Calculation Book, consisting of the following information in a 3-ring binder:
- Traverse of each Quarter Section for which corners were established.  
Traverse of each centerline shown on the Results of Survey
  - Station and offset listing of all ADOT Right of Way Monuments tied, referenced to the Centerline(s) of the Existing Highway Right of Way
  - Traverse of all right of way lines shown on the Results of Survey
  - Hard copy printout of the entire coordinate file in order of increasing point Number
  - Copies of Corner Recovery sheets
  - One (1) Compact Disk (CD-R format) with the CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section. If available, digital photo files of monuments shown on the Corner Recovery sheets will also be included.
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REVIEW TIME FOR THE **FINAL REVIEW** WILL BE TEN (10) WORKING DAYS

**B. FINAL REVIEW** **DUE BY, \_\_\_\_\_**

- This review shall be a complete and thorough review of each sheet of the Right of Way Survey to ascertain that all information is clearly and accurately illustrated.
- The following items shall be submitted for use in conducting the **Final Review** of the Right of Way Survey:
  - The Initial Review check prints.
  - One (1) half-size print of the Initial Survey
  - Revised ASCII file and Calculation Book, if necessary
  - Additional Corner Recovery sheets, if pertinent

**C. FINAL TASK SUBMITTAL** **DUE BY, \_\_\_\_\_**

When all comments have been addressed, Consultant shall submit the following:

- One (1) half-size print of the Results of Survey
- Review check prints
- Revised Calculation Book sheets, if necessary.
- Additional Corner Recovery sheets, if pertinent
- An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters.** Consultant shall ensure that this file is free of extraneous text

such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric numbers will be accepted.**

#### **D. ACCEPTANCE SUBMITTAL – RESULTS OF SURVEY**

After such time that any existing R/W monuments or missing section corners have been set and the R/W Plans Section is ready to accept the Results of Survey, the Consultant will be notified and the following items will be submitted:

1. One (1) copy of all Final CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section, and the electronic ASCII file. The files shall be transmitted to the ADOT Right of Way Plans Section on one (1) Compact Disk (CD-R format). Unless the Consultant uses an approved digital signature per ARS 41-132, the seal block on the electronic files shall be left blank. When applicable, the electronic Microstation files of the Existing R/W Exhibit Maps shall also be included on the CD. If available, digital photo files of monuments shown on the Corner Recovery sheets will also be included.
2. Full-size set of sealed and signed mylars trimmed to 22" x 34"

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#### **Task: EXISTING R/W EXHIBIT MAPS**

It has been the decision of the ADOT Right of Way Plans Section to include a Task to prepare Existing R/W Exhibit Maps for the portion of the corridor that is to be surveyed.

The Consultant shall analyze, calculate and plot each area of the existing right of way according to the documents in the Existing R/W Report. The Exhibit Maps are to show a different cross-hatched area for each individual document. For each document, the document item number/letter from the existing right of way report as well as the document recording number will be listed with a leader to its hatched area. Appropriate notes will also be added that can designate areas of concern, such as "gaps" of existing right of way, ambiguity in the record document, or areas in which the document description differs from what is being portrayed on the current right of way plans.

The Consultant will also prepare and incorporate the index to existing R/W table(s) into the Exhibit Maps. The existing R/W table(s) will be incorporated into the Right of Way plan set at a later time. The Consultant is also to include a list of all pertinent R/W maps, R/W plans, as-built plans or other documentation that are associated with the area depicted on the Exhibit Maps. The Exhibit Maps are only to be used for internal ADOT R/W purposes and are not required to be sealed by the Consultant.

The standard ADOT R/W Plans border and title block will be used for the Exhibit Maps.

#### **The Consultant shall:**

1. Prepare the Existing R/W Exhibit Maps as outlined above
2. Prepare \_\_\_\_ Exhibit Maps at a suggested scale of 1" = \_\_\_\_.

## REVIEWS:

REVIEW TIME FOR THE EXISTING R/W EXHIBIT MAPS WILL BE TEN (10) WORKING DAYS

(Note: Only 1 review will be associated with this task)

### A. INITIAL REVIEW

DUE BY, \_\_\_\_\_

1. The Existing R/W Exhibit Maps shall be submitted for review at the earliest possible time after the Consultant has received the existing R/W documentation and has completed plotting the information. The Existing R/W Exhibit Maps shall be submitted to the ADOT RW Plans Section for review after the Consultant has completed a Quality Assurance check on all aspects of the Task. Sheets submitted for review which indicate that such a Quality Assurance Review has not been performed will be returned un-reviewed to the Consultant for correction.
2. The following items shall be submitted for use in conducting the Review:
  - a. One (1) half-size print of the Existing R/W Exhibit Maps to be used as check prints.

Upon approval of the Existing R/W Exhibit Maps, the Consultant will submit one (1) set of half-size bond prints. The electronic Microstation files of the Exhibit Maps shall be included on the CD for the Acceptance Submittal of the Results of Survey.

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### Task: BASEMAPPING PLANS

- A. The Consultant shall prepare a set of Right of Way Basemapping Plans in accordance with those Standards and Specifications for Right of Way Plans, unless otherwise directed by the Right of Way Plans Section, utilizing materials included with this Scope of Work.

Basemapping Plans will be the footprint of the Right of Way Plans. The plan set shall include the same components as the Right of Way Plans set (Cover Sheet, Standard Abbreviations and Symbols Sheet, Ownership Record Sheets, Vicinity Maps, Plans Sheets, and the Results of Survey).

Basemapping Plans will include information obtained from the Results of Survey. They will show all ownerships of the entire Project as defined in the Vesting Instruments or Title Reports. Basemapping Plans will show the information outlined in the Existing Right of Way Report. The Ownership Record Sheets will show only the owner name of each parcel, the total area of each parcel, and the plan sheet reference number of each parcel.



All pertinent existing topographical information (i.e. buildings, fences, signs, planter boxes, pavement, turn outs, etc) will be shown on the plans from the electronic files used to develop the construction design plans.

Mylars for Basemapping Plans will not be included with the Final Task Submittal for Basemapping.

**The Consultant shall:**

1. Prepare one (1) Cover Sheet.
2. Prepare one (1) Standard Abbreviations & Symbols sheet
3. Prepare \* (\*) Ownership Record Sheet(s). Number of Parcels: \* (\*)
4. Prepare \* (\*) Vicinity Map(s) at a scale of 1" = \*
5. Prepare \* (\*) Plan Sheet(s) at a scale of 1" = \*
6. Prepare half-size Point Identification Sheets for all calculated points (centerlines, section corners, section line ties, etc.) utilizing the Basemapping Plan Sheets as a base drawing. Unnecessary text information may be removed.
7. Prepare a Calculation Book as outlined below.

NOTE: Basemapping Plan Sheets will be prepared using the current CADD Standards and cell library.

**REVIEWS:**

REVIEW TIME FOR THE INITIAL REVIEW WILL BE FIFTEEN (15) WORKING DAYS.

**A. INITIAL REVIEW: DUE BY, \_\_\_\_\_**

1. Basemapping Plans and calculations will be submitted for review when all phases of work have been accomplished. The Basemapping Plans will be submitted for review **after** the Consultant has completed a quality assurance/ quality check on the entire Basemapping Plans information. The Consultant is responsible for the accuracy of all calculations and plotting of all ownership information and all Existing Right of Way information, however, these will be reviewed and returned to the Consultant for correction if errors are discovered. Basemapping submitted for review which indicates that such a Quality Assurance Review has not been performed will be returned un-reviewed to the Consultant for correction.
2. The following items will be submitted for use in conducting the Basemapping Plans Review:
  - a. One (1) half-size print of Basemapping Plans, to include: Cover Sheet, Standard Abbreviations & Symbols Sheet, Ownership Record Sheets, Vicinity Maps, Plan Sheets, and Results of Survey.
  - b. One (1) Compact Disk (CD-R format) with the CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section.
  - c. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters**. Consultant shall ensure that this file is free of

extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric point numbers will be accepted.**

- d. Calculation book, consisting of the following information in a 3-ring binder:
- Traverse of all centerlines that are depicted on the Right of Way Plans
  - Station and Offset listing of the Existing Highway Right of Way, referenced to the existing highway centerline.
  - Hard copy printout of the entire coordinate file in order of increasing point number.
  - One (1) half-size print of Point Identification Sheets for all calculated or established points (centerlines, section corners, section line ties, etc.) utilizing the Basemapping Plans as a base drawing, showing all points. The sheets may be a specialized plot omitting unnecessary information.
  - An 8-1/2 X 11 point map for each parcel, together with the calculations for the total area of each parcel.
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REVIEW TIME FOR THE **FINAL REVIEW** WILL BE TEN (10) WORKING DAYS

**B. FINAL REVIEW**

**DUE BY, \_\_\_\_\_**

1. This review shall be a complete and thorough review of each sheet of the Basemapping Plans to ascertain that all information is clearly and accurately illustrated.
2. The following items shall be submitted for use in conducting the **Final Review** of the Basemapping Plans:
  - a. The Initial Review check prints.
  - b. One (1) half-size print of the Basemapping Plans
  - c. Revised ASCII file and Calculation Book, if necessary

**C. Final Task Submittal: BASEMAPPING PLANS**

**DUE BY, \_\_\_\_\_**

When all comments have been addressed, Consultant shall submit the following:

1. Final CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section, and the electronic ASCII file. The files shall be transmitted to ADOT Right of Way Plans on one (1) Compact Disk (CD-R format). Unless the Consultant uses an approved digital signature per ARS 41-132, the seal block on the electronic files shall be left blank.
2. Revised Calculation Book sheets and Point ID sheets, if necessary.

3. One (1) half-size print of completed Basemapping Plans.  
(Mylars for Basemapping Plans will not be included at this time)
  4. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters**. Consultant shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric point numbers will be accepted.**
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#### **Task: FINAL RIGHT OF WAY PLANS**

- A. The Final Right of Way Plans are the continuation of the Basemapping Plans. The \_\_\_% Design requirements have been received and are to be used in the production of the Final Right of Way Plans.

The Consultant shall prepare a set of Final Right of Way Plans in accordance with those Standards and Specifications for Right of Way Plans, utilizing materials included with this Scope of Work.

The Final Right of Way Plans will be prepared utilizing CADD files in native MicroStation file format. Cell libraries provided by ADOT will be utilized. All Final Mylars shall be trimmed to 22"x 34" prior to submittal to ADOT.

All pertinent existing topographical information (i.e. buildings, fences, signs, planter boxes, pavement, turn outs, etc) will be shown on the plans from the electronic files used to develop the construction design plans.

It will be noted that whenever a right of way control point is located on a property line, a field survey will be required as to the proper location of the property line and will be indicated on a Supplemental Results of Survey.

In the event that a control point does fall on a property line, a supplemental survey showing the reasoning used for the placement of the control point on a property line will be required. Evidence such as title information, existing property corners (properly described) and lines of occupation will be considered in the placement of the control point monument.

It should be noted that there may be a possibility of moving the control point to avoid a property line which would require a field survey. This should be done during the initial review of the Right of Way requirements as supplied by the engineering consultant at the 30% design stage.

**The Consultant shall:**

1. Complete \* (\*) Ownership Record Sheet(s). Number of Parcels: \* (\*)
2. Complete \* (\*) Vicinity Map(s) at a scale of 1" = \*
3. Complete \* (\*) Plans Sheet(s) at a scale of 1" = \*
4. Prepare half-size Point Identification Sheets for all calculated points (centerlines, section corners, section line ties, etc.) utilizing the Basemapping Plan Sheets as a base drawing. Unnecessary text information may be removed.
5. Prepare a hard copy printout of the entire coordinate file in order of increasing point number
6. Prepare station and offset listing (hard copy only) of all points used in lines of new acquisition (New R/W, New Drainage Easement, etc.) tying to the Construction centerline. Ties to centerline spirals shall not be included but rather the semi-tangent shall be utilized. The Final Right of Way Plans shall not depict any ties to a centerline spiral. All centerlines shall be equated to each other and all centerlines, New R/W lines, and Existing Highway R/W lines shall be tied to all found Section and Mid Section lines. All ties on a centerline curve, New R/W, and Existing Highway R/W shall include a Local Tangent Bearing. All Spiral-to-Curve (SC) and Curve-to-Spiral (CS) points on centerlines shall include Local Tangent Bearings (in the direction of the curve).

**B.** The following items are typically used to complete this task:

1. Title Reports for those parcels from which acquisition is anticipated.
2. Construction/Design Plans for new project
3. Topography CADD files for the new Project in MicroStation format
4. Design CADD files for the new Project in MicroStation format

## **SUBMITTALS / REVIEWS:**

**REVIEW TIME FOR THE INITIAL REVIEW WILL BE FIFTEEN (15) WORKING DAYS.**

### **A. INITIAL REVIEW**

**DUE BY, \_\_\_\_\_**

1. Final Right of Way Plans and calculations will be submitted for review when all phases of work have been accomplished. The Final Right of Way Plans will be submitted for review **after** the Consultant has completed a quality assurance/ quality check on the entire Final Right of Way Plans information. The Consultant is responsible for the accuracy of all calculations and the information shown and recited on the Final Right of Way Plans, including descriptions, plotting of all ownership information, areas of acquisition and all Existing Right of Way, however, these will be reviewed and returned to the Consultant for correction if errors are discovered.
2. The following items should be submitted for use in conducting an **Initial Review** of the Final Right of Way Plans:
  - a. One (1) half-size print of Final Right of Way Plans, to include: Cover Sheet, Standard Abbreviations & Symbols Sheet, Ownership Record Sheets, Vicinity Maps, Plan Sheets, and Results of Survey.

- b. One (1) Compact Disk (CD-R format) with the CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section.
  - c. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters**. Consultant shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric point numbers will be accepted.**
  - d. Calculation book (3-ring binder) with the following information:
    - Traverse for each Centerline.
    - Parcel Traverse Sheet of the Total Area, Gross Area, Net Area, Easement Area, and Remainder Area of all Parcels shown on the Ownership Record Sheet.
    - Station and Offset listing of all points to which station/offset information is shown on the Right of Way Plans. This includes, but is not limited to, New Right of Way control points, New Easement control points, and centerline intersections. This shall serve as supporting documentation for data shown on the Right of Way Plans.
    - Hard copy printout of the entire coordinate file in order of increasing point number
    - Point Identification Sheets based on a half-size set of R/W Plans showing all points. Sheets may be a specialized plot omitting unnecessary information. An individual ID sheet for each parcel may be necessary.
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REVIEW TIME FOR THE **FINAL REVIEW** WILL BE TEN (10) WORKING DAYS

**B. FINAL REVIEW:** **DUE BY,** \_\_\_\_\_

- 1. This review shall be a complete and thorough review of each sheet of the Final Right of Way Plans to ascertain that all information is clearly and accurately illustrated.
- 2. The following items shall be submitted for use in conducting the **Final Review** of the Final Right of Way Plans:
  - a. The Initial Review check prints.
  - b. One (1) half-size print of Final Right of Way Plans and Results of Survey
  - c. Revised Calculation Book sheets and Point ID sheets, if necessary.
  - d. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters**. Consultant shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric numbers will be accepted.**

**C. FINAL TASK SUBMITTAL DUE BY, \_\_\_\_\_**

When all comments have been addressed, Consultant shall submit the following:

1. One (1) half-size print of the Final Right of Way Plans set.
2. Revised Calculation Book sheets and Point ID sheets, if necessary.
3. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters**. Consultant shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric numbers will be accepted.**

**D. ACCEPTANCE SUBMITTAL - FINAL R/W PLANS**

When the R/W Plans Section is ready to accept the Final R/W Plans, the Consultant will be notified and the following items will be submitted:

1. Two (2) copies of all Final CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section, and the electronic ASCII file. An electronic PDF file of each sheet will also be included. The files shall be transmitted to the ADOT Right of Way Plans Section on two (2) Compact Disks (CD-R format). Unless the Consultant uses an approved digital signature per ARS 41-132, the seal block on the electronic files shall be left blank.
2. Full-size set of Sealed and Signed mylars trimmed to 22" x 34"

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**Task: SUPPLEMENTAL RESULTS OF SURVEY**

The Consultant shall prepare a R/W Supplemental Results of Survey that will conform to guidelines set forth in the R/W Plans Section Standards manual and the R/W Plans Section CADD Standards.

If the situation prompting a Supplemental Survey is that a New R/W control point falls on a property line, a supplemental survey showing the reasoning used for the placement of the control point on a property line will be required. Evidence such as title information, existing property corners (properly described) and lines of occupation will be considered in the placement of the control point monument.

To properly execute the Supplemental Survey, it is typically necessary that the Consultant must enter onto properties that are adjacent to or in proximity to the highway. Before entering any non-ADOT owned properties adjacent to or near the highway, the Consultant is required to make every reasonable effort to give oral or written notice to the owners of said properties, pursuant to ARS 33-104.

In the execution of the Supplemental Survey, the Consultant will comply with all applicable State statutes and all applicable standards of the current Arizona Boundary Survey Minimum Standards.

Once the Supplemental Survey drawing is accepted and filed in the File Room of the ADOT R/W Plans Section, the Consultant will have satisfied statutory recording requirements.

**The Consultant shall:**

1. Perform a field survey as outlined above
2. Prepare a Supplemental Results of Survey Drawing at a suggested scale of 1" = \_\_\_\_\_. It is estimated that a total of \_\_\_\_\_ sheets will be produced. The Results of Survey will be sealed by an Arizona Registered Land Surveyor. Recordation of the Survey is the responsibility of the Surveyor. Final mylars shall be trimmed to 22"x34".
3. Prepare any additional Calculation Book sheets as required.

**REVIEWS:**

REVIEW TIME FOR THE INITIAL REVIEW WILL BE TEN (10) WORKING DAYS

**A. INITIAL REVIEW**

**DUE BY, \_\_\_\_\_**

1. The Supplemental Survey Drawing and Survey Calculations shall be submitted for review when all phases of work have been accomplished. The Supplemental Survey shall submitted to ADOT RW Plans for review **after** Consultant has completed a Quality Assurance check on the all aspects of the Task. Surveys submitted for review which indicate that such a Quality Assurance Review has not been performed will be returned un-reviewed to Consultant for correction.
2. The following items shall be submitted for use in conducting the Review:
  - a. One (1) half-size print of the Supplemental Survey to be used as check prints.
  - b. An ASCII coordinate electronic file containing the Point Number, Northing and Easting, in the following format: Point Number, Northing, Easting, (Description optional) using **commas as delimiters**. Consultant shall ensure that this file is free of extraneous text such as page numbers, headers, batch commands, and the like. This file should be such that it can be imported into a COGO program without reformatting by ADOT Right of Way Plans Section. **Only numeric point numbers will be accepted.**

- c. Additional Calculation Book sheets as required and/or as requested.
  - d. Additional Corner Recovery sheets, if pertinent.
- 

REVIEW TIME FOR THE **FINAL REVIEW** WILL BE FIVE (5) WORKING DAYS

**B. FINAL REVIEW** **DUE BY, \_\_\_\_\_**

1. This review shall be a complete and thorough review of each sheet of the Supplemental Survey to ascertain that all information is clearly and accurately illustrated.
2. The following items shall be submitted for use in conducting the **Final Review** of the Supplemental Survey:
  - a. The Initial Review check prints.
  - b. One (1) half-size print of the Supplemental Survey
  - c. Revised ascii file, if required

**C. Final Task Submittal: SUPPLEMENTAL SURVEY DUE BY, \_\_\_\_\_**

When all comments have been addressed, Consultant shall submit the following:

1. Review check prints
  2. Final CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section, and the electronic ASCII file. The files shall be transmitted to ADOT Right of Way Plans on one (1) Compact Disk (CD-R format). Unless the Consultant uses an approved digital signature per ARS 41-132, the seal block on the electronic files shall be left blank. If applicable and if available, digital photo files of monuments shown on the Corner Recovery sheets will also be included.
  3. One half-size print of the Supplemental Survey
  4. Sealed and signed, full size set of mylars trimmed to 22"x34"
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**Task: R/W STAKING FOR APPRAISALS**

The appraiser assigned to this project is \_\_\_\_\_ at (602) \_\_\_\_\_ - \_\_\_\_\_. The appraiser must be in attendance on the site just prior to completion of the staking, or immediately afterwards.

The R/W Group's appraiser assigned to this project has requested that the new right of way and existing right of way lines be staked for those areas specified above and below. The staking shall be of a temporary nature using nails or wood stakes with lath in dirt or landscaped areas, or PK nails and/or paint in pavement or hardscape areas. If paint is used, the paint color will be either hot pink or white. Where feasible, the Consultant will note on the lath or otherwise mark, the nature of the point (e.g. Proposed New R/W or Existing R/W) and



the point number. In addition to staking R/W corner and intersection locations, the Consultant may also be required to set additional points on the new and/or existing R/W lines between the corner and intersection locations (POT's & POC's). The staking interval of the intermediate points will depend on field conditions, but should be such that the locations of the new and existing R/W lines can be visually deduced. In no instance shall the distance between consecutive points be greater than 200'.

During the Staking, the Consultant will take digital photos of/along the lines that are being staked. The photo images are to be saved in JPEG format. Each photo will either contain a description/header, or, an index to the photos will accompany them. The description of each photo will sufficiently describe where the photo was taken, what direction the photo is pointing at and what the photo is showing— such as "At Pt.#450 looking westerly along new R/W on Parcel 10-5698". Unless hard copies are specifically requested, only the electronic JPEG files are required to be transmitted to the R/W Plans Section.

Upon completion of the Staking, the Consultant will prepare modified Point ID sheets, using the Point ID sheets already prepared for the Basemapping/Final R/W plans as the basis. The Appraisal Staking Point ID sheets will portray at a minimum the following information/data: section and aliquot lines, existing R/W lines, new R/W lines, parcel lines, parcel bubbles, north arrow, scale, 1/4 - 1/4's, index stations and show or indicate all points and/or locations that were staked. The points that were staked should be made visually distinctive by either electronic or manual methods. This can be achieved in several ways such as highlighting those points, or creating a separate symbol and placing the symbol over the point locations and adding a legend. The Appraisal Staking Point ID sheets are only to be used for internal ADOT R/W purposes and are not required to be sealed by the Consultant.

Along with the photos and Appraisal Staking Point ID sheets, the Consultant will also submit a brief report that is a summary of the Staking task. The types of items to address in the report are: what was the nature of the points that were set; typical spacing of intermediate points; any problem areas or areas that no points could be set due to obstructions; any conversations or issues with property owners while performing the staking, etc.

**The Consultant shall:**

1. Stake all points necessary as outlined above.
2. Notify the ADOT R/W Plans Section several days prior to when the staking will be completed.
3. Prepare Point ID sheets, photo (jpeg) files and a report of the staking as outlined above.

For ADOT cost estimate purposes, it is estimated that this task will affect the following:

\_\_\_\_\_ Parcels  
\_\_\_\_\_ Points to be staked

The following items are included with this Scope of Work:

1. Highlighted set of R/W Plans indicating parcels and points to be set.

**R/W STAKING DUE BY, \_\_\_\_\_**

## REVIEWS:

REVIEW TIME FOR THE POINT ID SHEETS, PHOTOS AND REPORT WILL BE FIVE (5) WORKING DAYS

(Note: Only 1 review will be associated with this task)

### A. INITIAL REVIEW

DUE BY, \_\_\_\_\_

1. The Appraisal Staking Point ID sheets, JPEG image files and report shall be submitted for review at the earliest possible time after the field portion of the staking has been completed. The Right of Way Staking Point ID sheets shall be submitted to the ADOT RW Plans Section for review after the Consultant has completed a Quality Assurance check on the all aspects of the Task. Sheets submitted for review which indicate that such a Quality Assurance Review has not been performed will be returned un-reviewed to the Consultant for correction.
2. The following items shall be submitted for use in conducting the Review:
  - a. One (1) half-size print of the Appraisal Staking Point ID sheets to be used as check prints.
  - b. Electronic files of all JPEG photo files.
  - c. One (1) report

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### Task: INITIAL R/W STAKING & R/W STAKING PLANS

For all new right of way corners, the initial monuments set shall be magnetically detectable and shall be of such a character that they can be set firmly in place based on ground conditions; examples are rebars, spikes or PK nails. The Consultant will also affix their registration number to the initial monument. The initial monuments must be in accordance with the current Arizona Boundary Survey Minimum Standards. In addition to setting the initial monuments, the Consultant shall also typically set a 4 foot guard lath and mark the lath with a permanent black ink felt marker with the designation of "ADOT R/W CORNER", and the point number. It is understood that these monuments will only be staked once by the Consultant and that it is the responsibility of the Construction Contractor to straddle the initial monuments. It will also be the responsibility of the Construction Contractor to preserve the integrity of all R/W monuments, whether initial or final, by protecting them from destruction, disturbance, or vandalism. Any monuments which are disturbed during construction shall be replaced by the Construction Contractor at their expense. At the conclusion of the Construction Project, this Scope of Work will be amended, or a Change Order issued, for the R/W Plans Consultant to set the final R/W monuments and to complete the R/W Monumentation Survey drawing.

Initial R/W monuments are typically to be set at the following locations:

- At all angle points along the new right of way lines

- At the intersections of the new right of way lines with each surveyed Township/Range line, Section, and Mid-Section line
- At the intersections of the new right of way lines with the boundaries of all platted Subdivisions
- On the new right of way line at points Left and Right of any station equation on the centerline that is controlling the location of the new right of way line

Final ADOT R/W drivable monuments will typically be set at the following locations:

- a) At angle points and Section and Mid-Section line intersections along the existing right of way line, where no new right of way is being acquired, and where the point has not been previously properly monumented (Locations to be determined by the ADOT R/W Plans Section for each project)
- b) On the existing right of way line at points Left and Right of any station equation on the centerline that is controlling the location of the new right of way line
- c) At new R/W corners for areas that ADOT will dispose of to the local jurisdiction after construction. For these corners, the Consultant will only set a rebar with an aluminum/brass cap of 2" in diameter. The only information that is to be stamped on the cap will be the responsible registrant's registration number and date. The letters "ADOT ROW" **will not** be stamped. Direction as to which corners fall within this category will be addressed on a project-by-project basis. If not possible to set the aforementioned monument, other permanent and acceptable monumentation will be set with permanent affixation of the responsible registrant's number on the monument. These monuments will be considered to be the final permanent monument.
- d) Depending on circumstances, some existing r/w monumentation may also require removal/destruction/refurbishing by the Consultant. (To be determined by the ADOT R/W Plans Section on a project-by-project basis)

In the situations of a) through d) above, the Consultant will refer to the current "ADOT R/W Plans Section Right of Way Monumentation Procedures & Standards" document for other related instruction and for details regarding monumentation specifications.

The Consultant will utilize the information and positions shown on the R/W Plans and in the R/W Plans Calculation Book to set the initial monuments.

After the staking of the initial monuments, the Consultant will prepare the Right of Way Staking Plan sheets, according to the current CADD Standards and cell library, and in native MicroStation file format. The Right of Way Staking Plan sheets will illustrate the type and kind of monuments that have typically been set, point number and coordinate information, and station & offset for all monuments that were set. The Staking Plan will also indicate any existing r/w monuments that were or need to be removed/destroyed. The Staking Plan will be provided to the Contractor, to indicate the total number of monuments that were set by the Consultant, and to be utilized as right of way control. No staking is to take place on parcels that have not yet been acquired.

In the event that the Consultant finds an existing R/W monument not previously found and/or shown on the Initial Survey, the Consultant shall locate said monument(s) and revise the affected sheets on the Results of Survey to include this additional information. The Consultant will submit the revised Results of Survey sheet(s) in a timely manner, before completion of this Task.

**The Consultant shall:**

1. Prepare an estimated \_\_\_\_\_ R/W Staking Plan sheets, at a suggested scale of 1" = \_\_\_\_\_.
2. Perform the initial r/w staking as outlined above.

It is estimated that a total of \_\_\_\_\_ monuments will need to be staked. Of the \_\_\_\_\_ monuments, \_\_\_\_\_ are to be initial R/W monuments set at new R/W corner locations, and \_\_\_\_\_ are to be final drivable monuments set at existing R/W corner locations.

The following items are included with this Scope of Work:

1. Highlighted set of R/W Plans/Results of Survey indicating monument locations & types to be set.
- 2.

**INITIAL R/W STAKING DUE BY, \_\_\_\_\_**

**REVIEWS:**

REVIEW TIME FOR THE R/W STAKING PLANS WILL BE FIVE (5) WORKING DAYS  
(Note: Only 1 review will be associated with this task)

**A. INITIAL REVIEW DUE BY, \_\_\_\_\_**

1. The Right of Way Staking Plan sheets and Survey Calculations shall be submitted for review at the earliest possible time after the field portion of the staking has been completed. The Right of Way Monumentation Staking Plan sheets shall be submitted to the ADOT RW Plans Section for review **after** the Consultant has completed a Quality Assurance check on the all aspects of the Task. Sheets submitted for review which indicate that such a Quality Assurance Review has not been performed will be returned un-reviewed to the Consultant for correction.
2. The following items shall be submitted for use in conducting the Review:
  - b. One (1) half-size print of the Right of Way Staking Plan sheets to be used as check prints.

Upon approval of the Staking Plan, the Consultant will submit one (1) set of full-size sealed and signed bond prints.

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**Task: FINAL R/W MONUMENTATION SURVEY**

Proper monumentation of the New Right of Way will insure and perpetuate ADOT's acquisition rights to those lands required to construct and maintain public roadways and also protect the property rights and interests of adjoining landowners.

When the Construction project has been nearly completed, it will be the responsibility of the Consultant to set and verify the final right of way monuments. The Consultant will set final drivable R/W monuments and Witness Posts as instructed in the current "ADOT R/W Plans Section Right of Way Monumentation Procedures & Standards" document. If the actual corner cannot be set, the Consultant will set a Witness Corner or Reference Markers, as outlined in said document. The Consultant is also responsible to locate any sectional corners that may have been reset by the Contractor and show them on the Monumentation Survey drawing.

Depending on circumstances, some existing ADOT R/W monumentation may also require removal/destruction by the Consultant. (To be determined by the ADOT R/W Plans Section on a project-by-project basis)

The Consultant will refer to the current "ADOT R/W Plans Section Right of Way Monumentation Procedures & Standards" document for other related instruction and for details regarding monumentation specifications.

Upon completion of the field work and the setting of the final monuments, the Consultant will then modify the previously completed Right of Way Monumentation Staking Plan sheets to create the Right of Way Monumentation Survey drawings. The Right of Way Monumentation Survey drawings will be prepared according to the current CADD Standards and cell library, and in native MicroStation file format. The Right of Way Monumentation Survey sheets will illustrate the type and kind of monuments set, and point number and coordinate information for all monuments set. The Monumentation Survey will also indicate any existing r/w monuments that were removed/destroyed.

In the execution of the Final R/W Monumentation Survey, the Consultant will comply with all applicable State statutes and all applicable standards of the current Arizona Boundary Survey Minimum Standards.

Once the Final R/W Monumentation Survey drawing is accepted and filed in the File Room of the ADOT R/W Plans Section, the Consultant will have satisfied statutory recording requirements.

**The Consultant shall:**

1. Perform a field survey and complete the task as outlined above.
2. Complete \_\_\_\_\_ R/W Monumentation Survey sheets, at a scale of 1" = \_\_\_\_\_.

It is estimated that a total of \_\_\_\_\_ monuments will need to be set and/or verified.

**COMPLETION OF FINAL MONUMENTATION STAKING DUE BY, \_\_\_\_\_**

**REVIEWS:**

REVIEW TIME FOR THE R/W MONUMENTATION SURVEY WILL BE TEN (10) WORKING DAYS

(Note: Only 1 review will be associated with this task)

**A. INITIAL REVIEW**

**DUE BY, \_\_\_\_\_**

1. The Right of Way Monumentation Survey sheets and Survey Calculations shall be submitted for review when all phases of work have been accomplished. The Right of Way Monumentation Survey sheets shall be submitted to ADOT RW Plans for review after Consultant has completed a Quality Assurance check on all aspects of the Task. Sheets submitted for review which indicate that such a Quality Assurance Review has not been performed will be returned un-reviewed to Consultant for correction.
2. The following items shall be submitted for use in conducting the Review:
  - a. One (1) half-size print of the Right of Way Monumentation Survey sheets to be used as check prints.

**Final Task Submittal: R/W MONUMENTATION SURVEY DUE BY, \_\_\_\_\_**

When all comments have been addressed, Consultant shall submit the following:

1. Two (2) copies of all Final CADD Files in native MicroStation file format, in a version that is currently acceptable to the R/W Plans Section, and the electronic ASCII file. An electronic PDF file of each sheet will also be included. The files shall be transmitted to the ADOT Right of Way Plans Section on two (2) Compact Disks (CD-R format). Unless the Consultant uses an approved digital signature per ARS 41-132, the seal block on the electronic files shall be left blank.
  2. The Right of Way Monumentation Survey mylar sheets, sealed by an Arizona Registered Land Surveyor. Recordation of the Survey is the responsibility of the Surveyor. Final mylars shall be trimmed to 22"x34".
  3. One (1) half-size print of the Right of Way Monumentation Survey sheets.
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# **ADOT RIGHT OF WAY PLANS SECTION**

## **RIGHT OF WAY CORRIDOR SURVEY & ANALYSIS GUIDELINES**

Feb. 2007

The following guidelines are to assist right of way on-call consultants and other surveyors in the analysis and calculation of State Highway right of ways. The methodologies and guidelines discussed below represent the ADOT Right of Way Plans Sections' recommended and preferred way of solving highway corridor alignments.

### **A. RESEARCH**

First, proper research of the right of way corridor is performed. This should include researching and obtaining surveys, right of way plans and strip maps at the R/W Plans Section's records room, engineering as-built plans of the highway at ADOT's engineering records room, recorded surveys of the project area, subdivision plats along the highway, adjacent property deeds, and if available at the time, the existing r/w report produced by the R/W Titles Section. If ADOT Photogrammetry & Mapping has mapping files, they can also be utilized for rough checking in regards to pavement and fence locations.

### **B. FIELD SURVEY**

Second, a right of way corridor field survey is performed. This survey typically will accurately locate appropriate sectional corners, all existing highway r/w monuments, and private property/subdivision monuments along the existing right of way lines, along both sides of the highway. If any centerline monumentation exists, it should also be located. GPS equipment and methods should be used for the field survey whenever possible. The extent of the survey will usually need to go beyond the construction project limits, to the next point of centerline alignment change, and perhaps further than that depending on circumstances - i.e. if the end of the project is in the middle of a curve, you should not end at the end of the curve; you would need to ascertain the next tangent section to adequately define the curve.

### **C. ANALYSIS AND CALCULATIONS**

After the field survey has been completed, then the analysis and calculation of the right of way corridor begins. Generally speaking, the found monumentation is used as a guide in trying to fit the record intent and geometry of the right of way documentation.

If the existing R/W report is available in a timely manner, the documentation and its intent will be held and will also be compared to the existing R/W shown on the available R/W maps and plans. If there is a discrepancy between the existing R/W report documentation and the R/W maps/plans, the documentation will be held and the discrepancy will be relayed to the R/W Plans Section.

If the existing R/W report is not available in a timely manner, the existing R/W maps and plans will be used to calculate a preliminary alignment and existing right of way. After the existing right of way report is received, the documentation will be reviewed and compared to the preliminary alignment and any necessary revisions will be made and relayed to the R/W Plans Section.

A discussion is needed concerning existing right of way monumentation. It is the position of the ADOT Right of Way Plans Section that in general, existing highway right of way monuments, especially if they were set pre-2000, are not considered to be "errorless" or "original"

monuments, and most of the time their position should not, or cannot, be literally "held". Many of these monuments were set using inaccurate field methods, and/or were set by non-surveyors who did not have the knowledge or place the value on the monument location, that a surveyor would. Nor is it possible to hold the intended record highway right of way width (give it its due – no more or no less) when a pair of monuments at a control station do not match the record width. Depending on when they were set, the right of way angle irons may or may not be "the" monument. If it can be reasonably established that the angle iron was set pre-1959, then it may be considered as the R/W monument. If the angle iron was set post-1959 it will then be considered as a reference marker or witness post. Customarily, the angle irons that are reference markers were set on the right of way line, but were usually set plus or minus 2 foot up or down station from the right of way monument.

The first thing that needs to be established is the existing right of way centerline. The centerline will typically not represent a "simple" or quick solution such as splitting pairs of found monuments and connecting the dots, or holding one pair of monuments and then holding the record geometry for the rest of the alignment. The centerline is usually solved piece by piece, by a trial and error method, until the entire project is solved. For projects that have no curved sections, and for tangent sections of highway, a linear regression can normally be performed on the found monumentation, that will result in a best-fit alignment for the corridor and/or tangent sections.

For projects that have curved sections, the alignment of tangent sections are usually solved first, then the PI's of the curves are solved, then the PC's, PT's, SC's, etc. are solved. It should also be noted that preliminary calculations of centerline – section line intersections and comparing them to record ties can also have an influence on the position of the alignment.

General rules for solving the centerline alignment are:

- a) Hold the record degree of curvature and let the arc length (and delta) float to generally fit the monumentation and/or the best-fit alignment. If the radius distances are large (greater than 10,000') the radius can be adjusted, if necessary to solve the centerline.
- b) All points of curvature should be tangent. If absolutely necessary, non-tangent curves can be used if all "tangent options" have been exhausted, and upon approval by the R/W Plans Section.
- c) Straight tangent segments should remain straight and not have minor deflections or angle points introduced in the alignment, when none have never been recorded or intended. An exception may be made if : 1. the tangent is located within private property, 2. there is a preponderance of evidence to create an angle point, and, 3. approval is given by the R/W Plans Section.
- d) Spiral lengths are normally held at their record lengths.
- e) Basis of Stationing – the basis of stationing should be at the location of a centerline control point (PC, PT, TS, etc.) where a pair of R/W monuments have been found at that location and their measured relationship to each other is good compared to the record. Whenever possible, the station value for the basis of stationing will be a record station from an existing R/W map or R/W plan. If no R/W maps or plans exist, then a record as-built station can be used, if available. A secondary alternative is to hold the record station at the intersection of the R/W centerline and a measured section line. If there is more than one suitable choice for the basis of stationing on a project, the location that should be chosen is the one that will create the most harmony between record station values and measured station values on the found R/W monuments.

Unless otherwise approved by the R/W Plans Section, all record station equations will be re-established.

As far as what kind of measured or calculated differences there are between the final position of centerline control points and existing r/w points, and existing monumentation, there is not a set



rule or difference. However, what is considered to be acceptable is on the order of several tenths of a foot to as much as a 1-3 feet in other places. This applies to both the station and offset components.

In the centerline analysis process, all monuments need to be considered, but not necessarily in the final accepted determination of the alignment. For example, in a hypothetical 3 mile project with several curves and tangents you field locate 12 existing r/w monuments. After doing some initial analysis and trial and error solutions you find that 10 of the monuments all relate to each other quite well, according to the record geometry, and that the deviation of error in your centerline solution using only the 10 monuments is on the order of a couple of tenths. If introducing the other 2 monuments in the analysis then significantly moves the alignment and the maximum deviation then is close to one foot, then you can reject those monuments and not use them in the determination of the final alignment.

After the Consultant has:

- a) completed the field portion of the survey,
  - b) performed preliminary centerline alignment calculations,
  - c) developed a general methodology and framework of how they will calculate and solve the corridor, and
  - d) before they have commenced with the production of the Results of Survey drawing,
- a meeting will be held between the Consultant and the R/W Plans Section. The Consultant will go over the monumentation and evidence that was found, and outline the methodology they plan to use. Examples would be what record station(s) will be held, if they intend on not holding record degree of curvature for any curves, use of any stations equations, if they will reject any monuments in the analysis, etc. At this time, the Consultant will also indicate any sectional corners that may not have been found during the field portion of the survey.

After the centerline alignment is solved, then the existing right of way lines will be calculated. For corridors where the existing right of way lines are parallel and concentric to the centerline, that concentricity and parallelism will be held, using the record r/w width. For existing r/w lines that are not parallel to the centerline, the solution will best follow the record intent, as evidenced by the monumentation. If no monumentation exists, then a proration of record intent is regularly performed. Unless otherwise shown on the r/w plans, or in a deed, r/w lines opposite centerline spirals should be chorded. If a deed or the r/w plans indicate a parallel spiral, although technically impossible, an approximate parallel spiral will be calculated. One way of doing this is to hold a radial point opposite the centerline TS and SC (or CS and ST) and force-fitting a spiral curve in; the ease and accuracy of doing this may rely on the capabilities of your COGO software.

For all existing R/W corner locations, you will customarily end up with a "good" calculated coordinate value at the existing r/w corners, and a found coordinate value at the r/w monument, with the difference in position being on the order of what was discussed earlier.

#### **D. SUMMARY**

The time it takes to properly analyze and calculate a right of way corridor using the above guidelines can vary greatly depending on the length of the project, the number of segments to the alignment, how good the existing documentation is, and how much monumentation is found. At the one end of the spectrum, you can have a short 1 mile project that only encompasses one tangent section that begins and ends just beyond the project limits. You only found 2 pairs of existing r/w monuments at the beginning and end of the tangent section, and they all fit good within themselves and with the record information. In this example, the entire corridor could be

calculated and solved within several hours. At the other extreme, you can have a 20 mile long project containing dozens of curved sections, spirals and tangent segments, and you found multitudes of monumentation, some of which is conflicting. For this example, a number of days may be necessary.

Another factor that can influence the time and effort in solving the corridor is the nature of the adjacent property ownership. In general, if the project is within private ownership, more care and effort must be exercised than if it is located solely within public lands.

It is the opinion of the R/W Plans Section that if the above guidelines are used, a higher level of consistency and corridor location will be achieved, even if different surveyors were to execute the survey and analysis.

The above guidelines shall be used for all projects being performed by on-call consultants hired by the ADOT R/W Plans Section, and are highly recommended to be used by other consultants and surveyors doing right of way determinations along the State highways. Although the above guidelines will apply and work for the vast majority of situations, some projects may have unique characteristics that deviation from the above guidelines is acceptable.

**FINALIZED**  
**Right of Way Acquisition Process**  
**Plans Preparation**

**7/27/00**

**Surveys**

The following procedures shall be performed for the preparation of Right of Way plans to be used for the acquisition of properties for ADOT Right of Way. These procedures are only required for perpetual property rights and interests and shall not be required for temporary construction easements.

**Research**

Pertinent record documents shall be obtained and researched. Document research for right of way survey starts at ADOT Records to obtain Right of Way plans, deeds of acquisition and as-built plans for the corridor to be surveyed. Subdivision plats, Result of Survey plats and deeds shall be acquired from the County Recorder's Office. Title reports will also be provided. Inquiries shall be made at municipal offices, utility company offices and other agencies for documentation of properties and/ or evidence to support the definition of properties in the corridor. Applicable Public Land System plats and notes shall be obtained from the Bureau of Land Management Office. Seek information from local surveyors whenever possible. Obtain parcel evidence when necessary.

**Right of Way Surveys**

Right of Way surveys for highway purposes are surveys of the existing or proposed right of way and the properties adjacent to the right of way. The construction of new highways will necessitate the acquisition of parts of these properties, resulting in severing existing property lines and destroying existing monuments. These procedures are intended to outline methods to perpetuate these monuments and to monument the proposed new right of way lines. In this process, plans will be produced to document the existing conditions prior to acquisition and to fully define the new right of way line and its relationship to the Public Land System.

A field survey shall be performed. The survey shall conform to ADOT procedures and standards set forth in the " Minimum Standards for Arizona Land Boundary Surveys", as adopted by the State Board of Technical Registration that is in effect at the time the surveys are performed. Applicable statutes and regulations are to be observed in addition to these standards. Adhere to the statutes and procedures concerning entering properties and access to properties.

Right of way surveys shall be to the extent necessary to substantiate right of way acquisition and documentation of existing right of way. This policy is not intended to limit the area the surveyor must survey to establish the right of way. If the surveyor is unable to support the right of way documentation in the immediate area of the acquisition parcels, the survey must be extended to the limits necessary to recover sufficient evidence to support the right of way documentation for the project.

The field survey shall consist of the location of Section Corners, Quarter Corners including the Center of Section (Center Quarter Corner), and other monuments set by the Survey of the Public Lands, when applicable. Obliterated corners shall be identified, re-established, and re-monumented. Corners deemed to be "lost" shall be identified, re-established, and re-monumented as specified in the "Manual of Instructions for the Survey of the Public Lands of the United States" in force at the time of the Original Survey. The field survey shall make a reasonable attempt to find any existing corner monumentation relevant to any private property parcels; highway, canal, and railroad right of way monuments; as well as major and minor street centerline monumentation that are determined to be impacted by ADOT Right of Way acquisition. If no monumentation is found during the field survey search, note on results of survey "not found". Existing Highway Right of Way, Survey, and As-Built Centerline Monumentation for the Project shall be tied to the Survey. Corners of Platted and Unplatted Subdivisions shall be tied if it can be determined that the subdivision will be impacted by new Right of Way acquisition.

## **Records**

A Results of Survey Drawing shall be produced and will be utilized to develop Right of Way Plans. The Results of Survey will be included in the right of way plans set for the project. All subsequent Supplemental Results of Surveys performed for the preparation or revision of the right of way plans including the supplemental survey to document the monumentation of the Right of Way will become a part of the Right of Way Plans set. These records will be archived in the right of way plans files and an electronic copy will be archived with ADOT TIR CADD Services and right of way plans shall maintain indexes for retrieval.

## **Defining Right of Way**

It shall be the responsibility of the surveyor to provide evidence necessary to define the existing and/ or proposed right-of-way within the project corridor. The surveyor shall use all evidence found in the field in conjunction with the existing documentation to define the project right-of-way. Sound professional judgement must be used in determination of the right-of-way. In the process of defining the right-of-way some of the field evidence may be rejected. The results of survey drawing will show all evidence collected, and indicate the reason or reasons for any evidence that may have been rejected by the surveyor.

It should be noted that the primary factor for determining existing right-of-way is documents calling for a centerline (construction, survey or right-of-way) strip description. The method used to re-establish the documented right-of-way shall be to reconstruct this centerline based upon the field evidence and record data. The documented right-of-way widths and courses can then be properly defined.

## **Right of Way Monuments**

In accordance with the project's schedule as determined by the Department, Right of Way shall be monumented. Locations of monuments shall include intersections of Right of Way with section lines and recorded subdivision boundaries. Right of Way shall also be monumented at angle points, and at beginning and ending of curves. Monuments shall conform to standards set forth

in " Minimum Standards for Arizona Land Boundary Surveys". The monuments shall be stamped with the land surveyor's registration number.

A supplemental results of survey will be produced after the monumentation process to document all Right of way monuments or reference monuments set, including documentation of what type monuments were set and how they are stamped.

### **Standard ADOT Right of Way Markers**

Upon notification from the Department, the surveyor shall set ADOT Right of Way markers (Standard Drawing C-21.10, C-21.20). Right of Way markers and alignments will be tied to the Survey.

Right of Way markers, (ADOT Standard Drawings C-21.10, C-21.20) not set during the acquisition process, shall be placed along Right of Way lines prior to, during or subsequent to roadway construction, depending upon project's requirements. The land surveyor that performed the Right of Way acquisition survey shall set these markers. If this is not possible, another contracted consultant professional registered surveyor or Department professional registered surveyor shall set the markers in compliance with the "Minimum Standards for Arizona Land Boundary Surveys". Revisions to Right of Way alignment during the construction process shall be staked in a similar manner.

Adjacent to all monuments; where practical, a standard Department guard stake will be set. If it creates a hazard or safety problem those guard stakes will be deleted, and so noted in the monument documentation. The standard guard stake will be a 5 foot tall steel fence post with a 5 inch by 9 inch aluminum sign attached to it. See Exhibit A

### **Monument Location**

A monument will be set at the following positions for the purpose of monumenting the Department's right-of-way:

- all angle points along the right-of-way lines,

- Points left and right of points defining the alignment. In most cases the alignment will be the centerline of Construction. Points defining the alignment are: Angle points, Curve Control Points, and Station Equations.
- Intervisible points, and/or points to render a maximum of 1000' feet between monuments.
- Points left and right of the Beginning of Project and End of Project.
- Points along section lines and recorded subdivision boundaries which intersect the right of way lines.
- It should be noted that sometimes a road or highway will be monumented on the centerline; especially when highways or roads follow sectional lines, or they are smaller or less traveled, or in urbanized areas.

### **Datum Specification**

Unless otherwise specified by the Department, the following shall apply: the basis of coordinates for the Survey shall be the North American Datum (NAD) 1983/92 definition, or any subsequent update approved by the National Geodetic Survey Office, and codified in Arizona Revised Statutes. Coordinates shall be Arizona State Plane Coordinates with the proper zone identified (East, Central, West); bearings shall be grid bearings; the project Grid Adjustment Factor shall be applied to provide ground coordinates. The Results of Survey shall clearly state the basis of coordinates, list any ADOT or NGS Control Points used to control the Survey, the Grid Adjustment Factor used, and any other adjustments made to the survey. This information shall be included in the Right of Way plans and the results of survey in the form of a standard datum note.

See Exhibit B

### **Recordation of Data**

The Department will receive and retain a copy of all field notes, computation sheets, calculations and pertinent documents that relate to the surveys.

# WITNESS POST

**PLEASE  
DO NOT  
DISTURB  
NEARBY  
SURVEY  
MARKER**

**FOR INFORMATION WRITE TO:**

ARIZONA DEPARTMENT OF TRANSPORTATION  
RIGHT OF WAY GROUP  
205 SOUTH 17<sup>TH</sup> AVENUE MS 612E  
PHOENIX, ARIZONA 85007



## **Exhibit B**

### **Datum Note:**

**Coordinates are NAD 83/92 Modified Arizona State Plane Coordinates, \_\_\_\_\_ Zone, using a Grid Adjustment Factor of 1.\_\_\_\_\_, these coordinates can be utilized as ground datum. To convert back to grid coordinates divide these values by 1.\_\_\_\_\_.**

## **Exhibit C**

### **Arizona State Board of Technical Registration**

#### **Minimum Standards For Arizona Land Boundary Surveys**

The following statements of standards for surveying practice are promulgated as minimum standards governing the creation, establishment, retracement or resurvey of land boundaries within the State of Arizona. Applicable statutes and regulations are to be observed in addition to these minimum standards of practice.

Responsibility for adherence to the minimum standards rests with the registered land surveyor in responsible charge of the work.

#### **Procedure**

1. The land surveyor must make a diligent search for pertinent record documents. Copies of applicable deeds, maps, title report or title opinions may be necessary. If the subject property is referenced to or described as an aliquot part of the U. S. Public Land Survey System, or a fraction thereof, relevant U. S. Government plats, field notes, appropriate Manual of Surveying Instructions and special instructions should additionally be consulted, when appropriate.
2. The land surveyor must thoroughly examine the information and data acquired.
3. The land surveyor must diligently search for and identify monuments and other physical evidence which could affect the location of the subject property's boundaries. A reasonable attempt must be made to recover controlling monuments for references thereto. The positions of controlling monuments which have been obliterated should be recovered or reestablished using the best available evidence. Physical evidence of apparent use and possible rights in the subject property by others should be evaluated. Lines of possession and occupation must be located, described, and where practical, an age determination made.

4. The land surveyor must conduct field measurements necessary to adequately relate the position of all apparent evidence pertinent to the boundaries of the property. All findings resulting from the field investigation must be accurately and completely recorded and retained permanently.
5. The land surveyor must make computations to verify the correctness of field data acquired and to confirm that measurements results are within acceptable tolerance limitations. Computations must be made to determine the relative positions of all found evidence.
6. In the event of a material discrepancy or a disagreement with the measurements or monumented corner positions of another surveyor, the land surveyor must make a reasonable attempt to contact the other land surveyor and attempt to resolve the disagreement.
7. The land surveyor should make an analysis, reach a final conclusion and set monuments so as to represent the location consistent with the best evidence available of corner positions and boundary lines. The land surveyor must advise the client of discrepancies which raise doubts concerning the boundary lines of the subject property and if requested the land surveyor should provide the client with a copy of the survey report.
8. All monuments, whether set or found, must be described and specifically identified as set or found, whenever shown on maps or referred to in documents prepared by the land surveyor. Descriptions of monuments must be sufficient in detail to readily facilitate future recovery and to enable positive identification, including map references. Monuments required by this section shall be metal, magnetically detectable, not less than one-half inch in diameter, not less than sixteen inches in length, and shall bear the land surveyor's registration number affixed, except however, the monument for a corner which falls upon solid rock or concrete shall be metal, magnetically detectable, firmly embedded, and stamped with the land surveyor's registration number.

9. The land surveyor shall prepare a scaled drawing of the results of survey for presentation to the client unless adequate existing information is available. In cases where a certification is required by state or local ordinance, the land surveyor must certify only those matters personally known to be absolutely true and must declare all other items only to the limit of the land surveyor's knowledge and belief.
10. The land surveyor must prepare and cause to be recorded corner records and record of survey documents if a material discrepancy exists in angular and/ or lineal calls as compared with new survey values as defined under Measurements Specifications Table 2 of these standards of practice.

### **Legal Descriptions**

When a land surveyor is called upon to prepare a legal description of real property, the land surveyor must include the following:

1. Sufficient caption, body, and where applicable, qualifying clauses.
2. Clearly stated relationship between the real property being described and the survey control or basis of unique location.
3. Clearly stated basis of bearing bearings or language which otherwise makes definite the method of direction and orientation for the lines of the subject property being described and the survey control related thereto when applicable.
4. Full and complete citations to maps, plats, documents, and other matters of record, fact or pertinence, which are intended to be incorporated into and made part of the legal description by reference thereto.
5. When called out, complete and detailed descriptions of physical monuments, both natural and artificial, such as to facilitate future recovery and to enable positive identification.
6. When appropriate, incorporated either by direct or by citation, sufficient data to enable a check of mathematical closure for the subject property being described.
7. The land surveyor's validated Arizona seal.

## **Measurement Specifications**

Measurements for the performance of land surveys as defined in A. R. S. 32-101(B)(19)(a)(b) & (c) Land Surveying Practice shall comply with the following required.

1. In order to properly apply the specifications herein to achieve the required accuracy the land surveyor must first classify the survey relative to the "Class of Survey" listed in Table 1. The land surveyor shall then apply at least the minimum specifications as listed in the appropriate column in Table 2. An error of measurement which is less than 0.03 feet between sequential monuments shall not by itself constitute a material discrepancy in any class of survey.
2. The significance of a discrepancy between the angular and lineal calls of record versus that resulting from the use of these specifications may only be determined from an analysis predicated on the law of random error propagation. If a material discrepancy is found to exist, appropriate action as outlined in these standards of practice shall be applied by the land surveyor.

**Table No. 1**

### **Class A. Urban Surveys:**

Surveys of land lying within or adjoining a city or town. This would also include the surveys of commercial and industrial properties, condominiums, townhouses, apartments and other multi-unit developments, regardless of geographic location.

### **Class B. Suburban Surveys:**

Surveys of land lying outside of urban areas. This land is used almost exclusively for single family residential use or residential subdivisions.

### **Class C. Rural Surveys:**

Surveys of land such as farms and other undeveloped land outside the suburban areas which may have a potential for future development.

### **Class D. Mountain and Marshland Surveys:**

Surveys of land which normally lies in remote areas with difficult terrain and which usually has limited potential for development.

Tables 1 and 2 Extracted from the current "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys as adopted by American Land Title Association and American Congress on Surveying & Mapping".

## **Classifications of ALTA-ACSM Land Title Surveys**

### **Introduction**

The degree of precision and accuracy necessary for a particular cadastral survey should be based on the intended use of the land without regard to its present use, provided the surveyor has knowledge of the intended use. If the surveyor has no such knowledge, the degree of precision may be based on the present use of the land.

Four general survey classes are defined using various state regulations and accepted practices. These general classes are listed and defined below.

### **Survey Classes by Land Use**

#### **Urban Surveys:**

Surveys of land lying within or adjoining a city or town. This would also include the surveys of commercial and industrial properties, condominiums, townhouses, apartments and other multi-unit developments, regardless of geographic location.

#### **Suburban Surveys:**

Surveys of land lying outside of urban areas. This land is used almost exclusively for single family residential use or residential subdivisions.

#### **Rural Surveys:**

Surveys of land such as farms and other undeveloped land outside the suburban areas which may have a potential for future development.

#### **Mountain and Marshland Surveys:**

Surveys of land which normally lies in remote areas with difficult terrain and which usually has limited potential for development.

Should these above cited specifications be in conflict with state laws, rules or regulations, the more stringent requirements must be followed.

The combined precision of a survey can be statistically assured by dictating a combination of survey closure and specified procedures for a particular survey class. ACSM and ALTA have adopted specific procedures for control surveys in order to assure the combined precision of a particular survey class. The statistical base for these specifications is on file at ACSM and is available for inspection. The surveyor shall employ, in his or her judgment, proper field procedures, instrumentation and adequate survey personnel in order to achieve accuracy's comparable to those adopted by ACSM for a designated class of survey.

## American Congress on Surveying and Mapping

### Minimum Angle, Distance and Closure Requirements for Classes of Surveys

(1)						
SURVEY CLASS	DIR. READING OF INSTRUMENT	INSTRUMENT READING ESTIMATED	NUMBER OF OBSERVATION PER STATION	SPREAD FROM MEAN OF D&R NOT TO EXCEED	ANGLE CLOSURE WHEN N=NO. OF STATIONS NOT TO EXCEED	LINEAR CLOSURE
	(2)	(3)	(4)	(5)		(6)
URBAN	20" <1' > 10" E	5" <0.1' > N.A.	2D&R	5" <0.1' > 5" E	10" x square root N	1:15,000
SUBURBAN	20" <1' > 10" E	10" <0.1' > N.A.	2 D&R	10" <0.2' > 10" E	15" x square root N	1:10,000
RURAL	20" M <1' > 20" E	N.A.	1D&R	20" M <0.3' > 20" E	20" x square root N	1:7,500
MOUNTAIN/ MARSHLAND	1' M <1' > 1' E	N.A.	1D&R	30" M <0.5' > 30" E	30" x square root N	1:5,000

Note (1) All requirements of each class must be satisfied in order to qualify for that particular class of survey. The use of a more precise instrument does not change the other requirements, such as number of angles turned, etc.

Note (2) Instrument must have a direct reading of at least the amount specified (not an estimated reading), i.e.: 10"=Micrometer reading theodolite, <1' > = scale reading theodolite, E=electronic reading theodolite, M=micrometer reading theodolite, or a vernier reading transit.

Note (3) Instrument must have the capability of allowing an estimated reading below the direct reading to the specified reading.

Note (4) D&R means direct and reverse positions of the instrument telescope, i.e., Urban Surveys require that two angles in the direct and two angles in the reverse position be measured and meaned.

Note (5) Any angle measured that exceeds the specified amount from the mean must be rejected and the set of angles re-measured.

Note (6) Ratio of closure after angles are balanced and closure calculated.

Note (7) All distance measurements must be made with a properly calibrated EDM or Steel tape, applying atmospheric, temperature, sag, tension, slope, scale factor and sea level corrections as necessary.

Note (8) EDM having an error of 5mm, independent of distance measured (Manufacturer's specifications)

Note (9) EDM having an error of 10mm, independent of distance measured  
(Manufacturer's specifications)

Note (10) Calibrated steel tape.



**5/03/06**

## **ADOT R/W PLANS SECTION RIGHT OF WAY MONUMENTATION PROCEDURES & STANDARDS**

### **RWM-1 Initial Right of Way Staking**

#### **RWM-1.01 General**

The staking of the new right of way is an essential task that is performed prior to the commencement of the construction. The initial R/W monuments will typically be set 2 weeks to one month prior to the start of construction for projects requiring new right of way. The initial R/W monuments will be set at all locations identified by the R/W Plans Section and will be set by the R/W On-Call Consultant. The Construction Contractor is responsible for straddling, referencing or otherwise maintaining the location of the initial R/W monuments during the term of construction, until the final R/W monumentation is set. If any initial R/W monuments are reset by the Construction Contractor, the nature of the monument will be such that it shall be in compliance with the current Arizona Boundary Survey Minimum Standards.

#### **RWM-1.02 Location and Description of Initial Right of Way Monuments**

The initial R/W monuments will typically be set at the following locations:

- a) At all new right of way corners;
- b) At the intersections of new right of way lines and surveyed section lines, mid-section lines, and subdivision boundaries;
- c) On the new right of way lines opposite Station Equations of the centerline(s) controlling the new right of way lines.

The initial monument that is to be set will be of a material and size that conforms to the current Arizona Boundary Survey Minimum Standards (ABSMS), with the registered land surveyor's identification number affixed to it. A ½ inch diameter rebar of suitable length for the conditions, with a plastic cap, is an example. Where feasible, a guard type stake, such as a 4 foot wood lath, will be placed in the immediate vicinity of the monument.

At the initial R/W staking stage it may not be possible to stake some locations due to physical obstructions or other such reasons.

In some instances the initial monument will not be replaced and will serve as the final R/W monument, such as where new right of way will be abandoned to the local jurisdiction after construction.

In other instances the R/W On-Call Consultant will set a final ADOT R/W monument (RWM-2.02) at existing R/W corner locations where a) the existing R/W is not being superseded by new R/W, and b) no monument previously existed or c) an existing monument was determined to be grossly out of tolerance (RWM-2.05) and d) where the new monument will likely not be disturbed by the intended construction.

#### **RWM-1.03 Right of Way Staking Plans**

At the completion of the initial R/W staking, the R/W On-Call Consultant will prepare the R/W Staking Plans. The Staking Plans will describe the monuments that were set at all locations, as well as identify those locations where a) a monument could not be set, b) the initial monument will serve as the final R/W monument, and c) where final ADOT R/W monuments have been set at existing R/W corner locations. The Staking Plans will also contain a table that lists the point number, ground coordinate values, and R/W plans station and offset for each location. The Staking Plans will be provided by the ADOT R/W Plans Section to the ADOT Project Manager, the Construction Contractor and/or the ADOT Resident Engineer after they have been reviewed and accepted by the R/W Plans Section.

## **RWM-2 Final Right of Way Monumentation - General**

The Final R/W Monumentation Survey process will commence when ADOT District personnel and/or the ADOT Project Manager notifies the R/W Plans Section at the earliest of the following 2 occasions: a) at such time when the final R/W monuments can be safely set, or b) at least 2 months prior to the end of all construction. After notification, the R/W On-Call Consultant will be tasked with performing the Final R/W Monumentation Survey. The R/W On-Call Consultant will also locate/tie-in any sectional corner monuments that were replaced by the Construction Contractor. In cases where the R/W On-Call Consultant had previously located the sectional corner monument prior to construction, and if the sectional corner monument set by the Construction Contractor was set within positional tolerance, but was not punched/stamped by the Construction Contractor, the R/W On-Call Consultant shall punch/stamp the monument as required.

For some projects (typically urban projects that have not fenced the new right of way) the Final Monumentation Survey may not take place until after the landscaping improvements are completed. For these projects the decision of when the Final R/W Monumentation Survey will be performed will be decided by District personnel near the end of the construction phase of the project, on a project-by-project basis.

### **RWM-2.01 Positional Tolerance**

Any sectional monuments that are set by the Construction Contractor that are determined by the R/W Consultant to be out of tolerance, as compared to the position of the prior monument, will be reset by the Construction Contractor at no expense to the Department. A sectional corner monument set by the Construction Contractor shall be considered out of tolerance if a punch mark identifying the actual location of the corner cannot be placed on the cap.

### **RWM-2.02 Drivable Monument Requirements and Specifications**

Near the end of the construction phase, the R/W On-Call Consultant will set an acceptable drivable type monument (refer to diagrams A-1 & A-2) for the final R/W monument at locations that were initially staked. The body of the final monument that will typically be set by the R/W On-Call Consultant will be magnetically detectable, have a diameter of one-half inch to 1 inch, and a minimum length of 24 inches. A three-inch aluminum or brass cap will be attached to and placed over the top of the body of the monument. The top of the cap can be flat or domed. The informational items that shall be stamped into the cap are:

- a) The R/W On-Call registrant's license number
- b) The year (four digits)
- c) The words "ADOT ROW"
- d) The R/W project TRACS number (i.e. 260 GI 272 H4472 01R)
- e) The reference Station as shown on the R/W plans (i.e. 105+58.73)
- f) The point number – as assigned by the R/W Consultant and shown on the R/W Monumentation Survey
- g) A circular punch mark at the actual point location (do not use a triangle or plus/cross symbol)

The lettering size will be 3/16ths of an inch high. Refer to diagram A-2 for the positioning of each text item. When ordering the caps for each project, the R/W Consultant shall have as many of the items as possible pre-stamped into the cap by the manufacturer, with the exception of the punch mark.

In loose soil conditions, the body of the monument shall be 36 inches in length and/or concrete will be poured around the body of the monument to stabilize it. If the location of the monument is in bedrock or similar substance, then a hole will be drilled into the bedrock so that magnetic material can be placed under the cap, and the cap will be fastened with epoxy glue.

In urban areas the top of the monument will typically be set flush to the ground surface or approximately one-tenth of a foot below the ground surface, depending on circumstances. In rural areas the top of the monument will typically be set flush with the ground surface to one-tenth of a foot above the ground surface.

### **RWM-2.03      Witness Posts**

After the R/W Consultant sets the final R/W monument, a witness post shall also be typically set next to the monument. The witness post will be of a durable fiberglass construction, such as carsonite. The post will be 2-1/2 inches wide, and a minimum of 5 feet in length. The post will be driven in to the ground to a depth of at least 18 inches, and shall leave a minimum height of 3 feet above the surface. Where extra stability is needed, an anchor kit will also be utilized in the installation of the witness post. Whenever possible, the witness post will be set on the right of way line at a distance of 1 foot from the monument, in the direction of increasing station from the monument. Refer to diagram A-1.

The witness post shall be brown in color. A decal will be attached to the face of the post at the top end. The decal will face the highway. The decal shall have a white background with black lettering. The decal should be UV resistant whenever possible. The size of the decal will be approximately 2-3/8 inches wide and 8-1/2 inches long. Refer to diagram A-1 for decal text.

In urban areas, the witness post will not typically be set for each point, unless otherwise directed by the Department.

### **RWM-2.04      Use of Witness Corners and Reference Marker Monuments**

If the R/W corner position falls in a location that is deemed un-settable for physical or other reasons, the R/W On-Call Consultant will first try to set a witness corner monument on the right of way line, as close as is practicable to the actual corner. If setting a witness corner is impractical, the R/W Consultant will set 2 reference marker monuments at convenient locations in the vicinity of the actual corner, within the ADOT right of way. The reference monuments can be set in one of the two following manners: a) approximately at 45 degree angles from the actual corner location, as measured from the right of way line(s), or b) set perpendicular on a straight line as referenced to the centerline of the highway, opposite the actual corner location – i.e. a 5 foot and 10 foot offset at the same station as the corner being referenced. When practicable, the witness corners and reference monuments will be set to a whole foot distance from the R/W corner position. Refer to diagram A-3.

If a witness corner is set, the stamping on the cap will also include, in addition to the items listed in Section RWM-2.03, the letters "WC", an arrow pointing in the direction of the actual corner, and the distance from the witness corner to the actual corner. Station information in this situation should not be included on the cap. Refer to diagram A-3.

If reference monuments are set, the stamping on the cap will also include, in addition to the items listed in Section RWM-2.03, the letters "RM", an arrow pointing in the direction of the actual corner, and the distance from the reference monument to the actual corner. Station information in this situation should not be included on the cap. Refer to diagram A-3.

If in the R/W On-Call Consultant's judgment and as agreed upon by the R/W Plans Section, it is not viable to set either a witness corner or reference monuments for a right of way corner location, and a well-defined permanent type structure is close to the corner position, such as the corner of a block wall, tie dimensions to the structure shall be documented on the R/W Monumentation Survey in lieu of setting the monuments.

### **RWM-2.05      Discovery of Existing Right of Way Monuments**

When the R/W On-Call Consultant is setting new monuments along the existing right of way line, a situation may be encountered where an existing monument is in the general vicinity of the calculated corner position. The existing monument may be an ADOT type monument, or a private monument. In this situation, the

R/W Plans Section and the registrant will decide if a new monument will be set or not, with the stipulation that a new monument shall not be set any closer than one foot from an existing monument, and that a new monument shall be set if the calculated position is greater than three feet from the existing monument. In no situation shall the Consultant remove or otherwise alter the existing monument, unless approval or direction is given by the R/W Plans Section. An exception to this is if the existing monument is within positional tolerance as defined by the current Arizona Boundary Survey Minimum Standards, and, the existing monument has no identification and/or pedigree, the registrant has the option of either affixing his registration number to the monument, or refurbishing it with a new ADOT right of way drivable monument as described above.

When the R/W On-Call Consultant is setting new monuments along the new right of way line, the situation may be encountered where an existing monument is in close proximity of the calculated corner position and that it can be determined that the existing monument was intended to have been set for the legal corner position. The existing monument will typically be a private monument. If the existing monument is within positional tolerance as defined by the current Arizona Boundary Survey Minimum Standards, the R/W On-Call Consultant will accept the existing monument. If the existing monument has no identification and/or pedigree, the registrant has the option of either attaching his registration number to the monument, or refurbishing it with a new ADOT right of way drivable monument as described above. If the existing monument is out of positional tolerance, the registrant will refer to the instructions in the preceding paragraph.

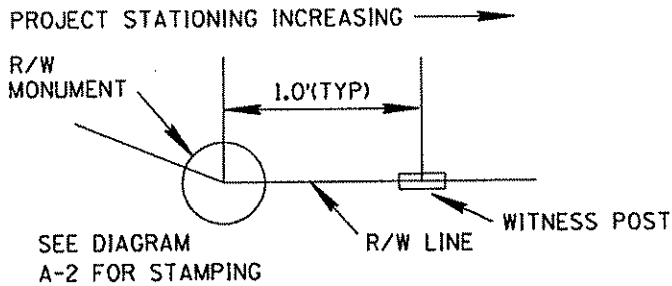
#### **RWM-2.06      Right of Way Monumentation Survey Drawing**

After the field portion of the final R/W Monumentation Survey has been completed, the R/W On-Call Consultant will prepare a Right of Way Monumentation Survey drawing. The drawing will document the final monumentation of the right of way corridor. The drawing will recite the location and description of all monuments set and found, including any witness corners, reference marker monuments, un-set corner locations, recently found right of way corners and reset section corners.

After acceptance by the ADOT R/W Plans Section, the Monumentation Survey drawing will be attached to and become a part of the right of way plan set. This plan set will be filed in the File Room of the ADOT Right of Way Plans Section and become a part of the public record.

# RIGHT OF WAY MARKER UNIT

## DIAGRAM A-1



PLAN VIEW

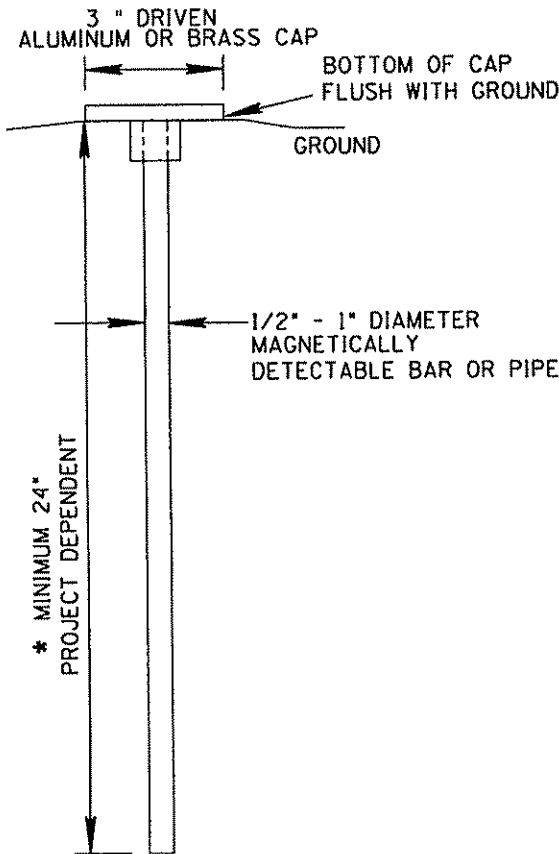
### GENERAL NOTES

1. A RIGHT OF WAY MARKER UNIT SHALL CONSIST OF A SURVEY MONUMENT, CAP AND AND WITNESS POST WITH DECAL.

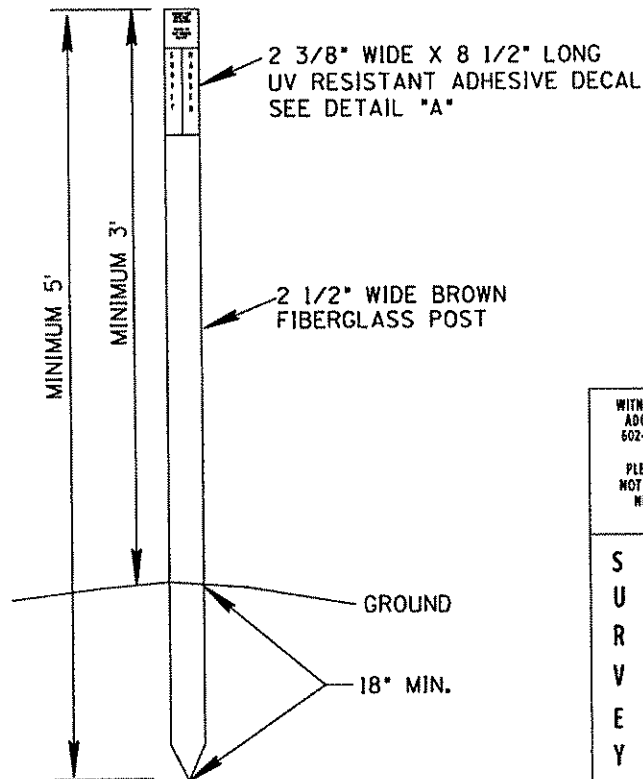
2. ALL R/W MARKER UNITS SHALL BE PLACED AT LOCATIONS SHOWN ON THE R/W PLANS OR AS DIRECTED BY THE DEPARTMENT.

\* THE LENGTH OF THE MONUMENT IS DEPENDENT UPON SOIL CONDITIONS. IN BEDROCK OR CONCRETE CONDITIONS, THE CAP AND MAGNETIC MATERIAL ONLY WILL BE SET UTILIZING EPOXY. IN LOOSE SOIL CONDITIONS, A MINIMUM LENGTH OF 36" SHALL BE UTILIZED.

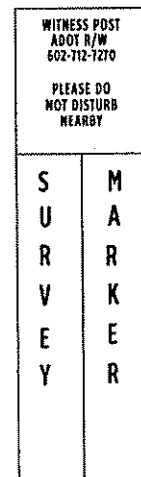
\*\* WITNESS POSTING REQUIREMENTS IN URBAN AREAS TO BE DETERMINED BY ADOT



R/W MONUMENT  
ELEVATION VIEW



WITNESS POST  
ELEVATION VIEW

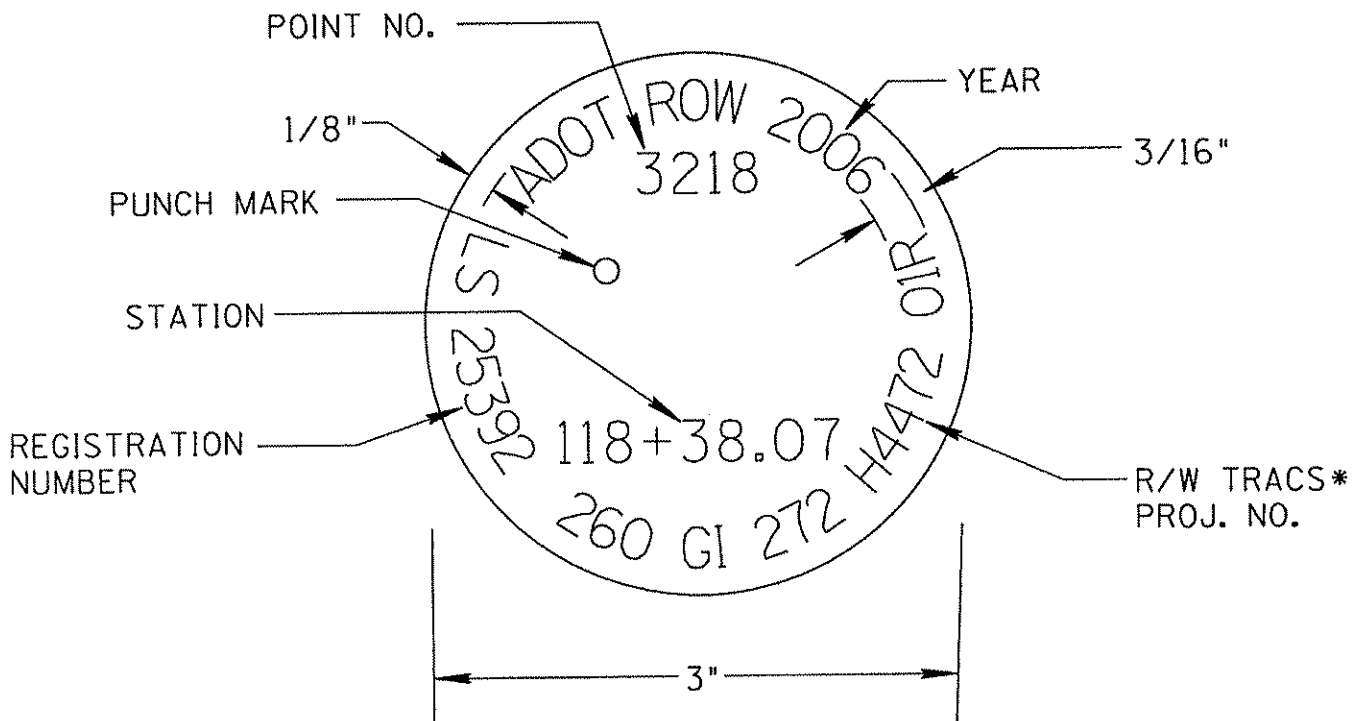


\*\* DETAIL "A"

05/03/06

# RIGHT OF WAY MONUMENT STAMPING INFORMATION AND LAYOUT

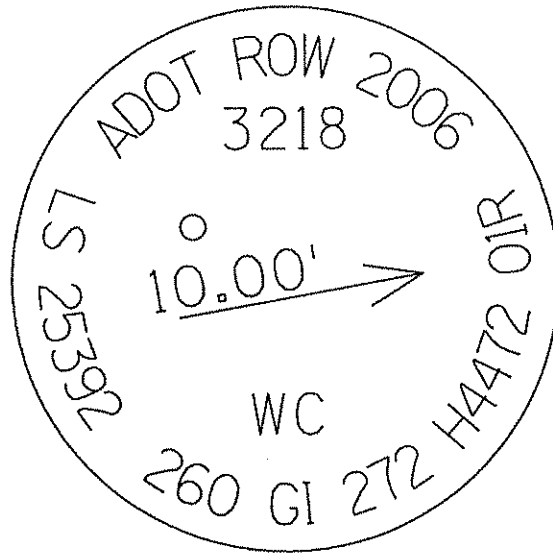
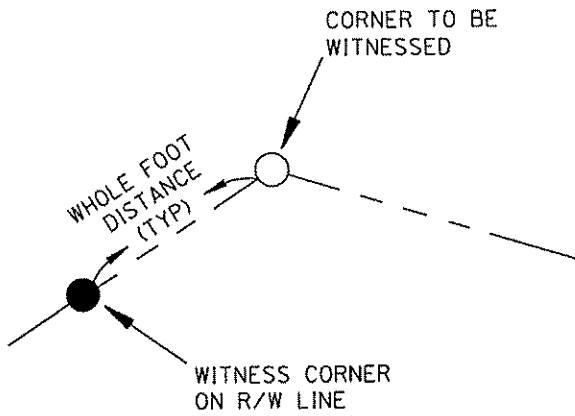
## DIAGRAM A-2



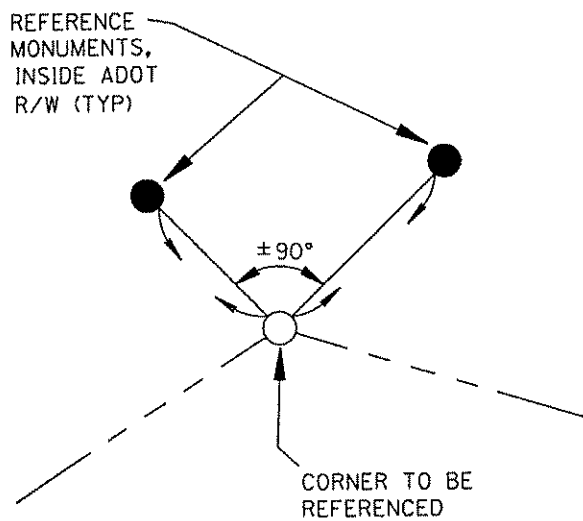
\* UNTIL THE USE OF THE FEDERAL ID PROJ. NO. IS PHASED OUT,  
THIS MAY INSTEAD BE THE FEDERAL ID PROJECT NUMBER.

05/03/06

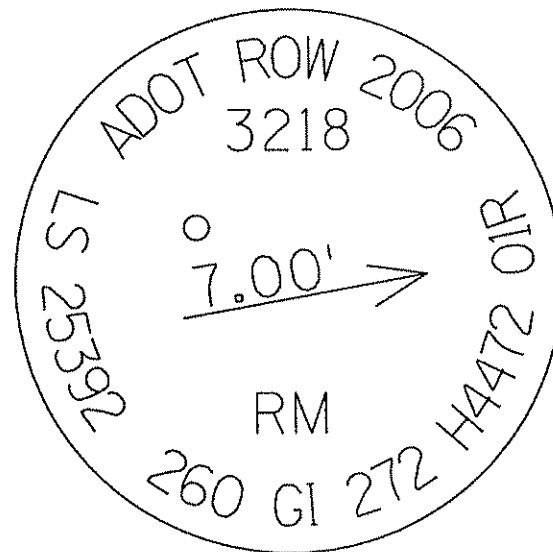
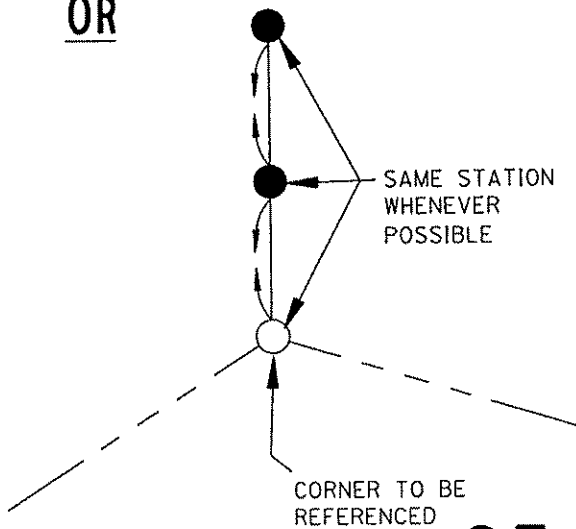
# DIAGRAM A-3



WITNESS CORNER



OR



REFERENCE MONUMENT

05/03/06

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
 R/W Tracs No. «RW Tracs No»  
 Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

## R/W Plans Section – Results of Survey Review Checklist

	COMPLETED	COMMENTS
<b>I. <u>Face Sheet* (See Exhibit F1 for Reference)</u></b>		
A. Standard General Info.		
1. Is Project Location correctly shown on State Map Insert? .....	<input type="checkbox"/>	
2. Highway name shown correctly (Top Center)? .....	<input type="checkbox"/>	
3. Section name shown correctly (Top Center)? .....	<input type="checkbox"/>	
4. R/W TRACS number shown correctly (Top Center)? .....	<input type="checkbox"/>	
5. Federal Project number shown correctly (Top Center)? .....	<input type="checkbox"/>	
6. Project length (Upper Left)? .....	<input type="checkbox"/>	
7. District (Upper Left)? .....	<input type="checkbox"/>	
8. Drawing number correct (Upper Left)? .....	<input type="checkbox"/>	
9. North arrow properly oriented? .....	<input type="checkbox"/>	
10. Sheet Index correct (Lower Left)? .....	<input type="checkbox"/>	
11. Are significant geographic features/references shown? .....	<input type="checkbox"/>	
12. Miles to nearest Town or City shown? .....	<input type="checkbox"/>	
13. Reference to recent adjacent Surveys shown (when applicable)? .....	<input type="checkbox"/>	

\*A face sheet is only required for large corridor type surveys that are not associated with a specific right of way plans project. A face sheet would look like an "official" face sheet on a right of way plans project. However, the presence of a cover sheet, or index sheet is dependent upon the size of the survey and the discretion of the R/W Plans Section and/or the consultant.

## II. Results of Survey Sheet(s) (See Exhibits F3 – F5 for Reference)

A. General		
1. Are all project and drawing numbers shown correctly? .....	<input type="checkbox"/>	
2a. Are Sections, Township(s) and Range(s) Numbers correct on the Survey sheets? .....	<input type="checkbox"/>	
2b. If area surveyed contains fractional/irregular Sections, are the GLO/BLM Lots shown? .....	<input type="checkbox"/>	
3. Are sectional corner descriptions shown? .....	<input type="checkbox"/>	
4a. Are all found and set sectional corner descriptions reasonably detailed? .....	<input type="checkbox"/>	
Also describe any found or set accessories. For Example: Unacceptable – Found GLO brass cap. Acceptable – Found 3" GLO brass cap on 2" pipe, stamped ....., 1' above ground, in mound of stones, Dated 1910, with original bearing trees to NW and NE.. Unacceptable – Found 1" pipe. Acceptable – Found 1" pipe, w/ tag LS 99999, 0.5' below ground, 1.0' southeast of wood fence corner.		
4b. If the point desc. of a sectional corner is a calculated point, is the method of .. calculation shown? .....	<input type="checkbox"/>	
4c. If the sectional corner is not found, or searched for, or not calculated, is the... description clear - i.e use "Searched For, Not Found", or "Not Searched For", instead of leaving no description. ....	<input type="checkbox"/>	
5. North arrow, County, Scale and Township & Range on each sheet? .....	<input type="checkbox"/>	
6. Are linetypes, fonts, and symbology compatible with ADOT R/W standards? .....	<input type="checkbox"/>	
7. Are bearings and distances correctly shown on all sectional lines? .....	<input type="checkbox"/>	
8a. Are bearings and/or curve data shown on all right of way/survey centerlines? ..	<input type="checkbox"/>	
8b. Is all the controlling centerline(s) alignment & stationing data shown? .....	<input type="checkbox"/>	
9a. Are all centerlines tied to measured sectional lines? .....	<input type="checkbox"/>	
9b. LTB's shown for POC centerline - sectional line ties? .....	<input type="checkbox"/>	
10. Is Found R/W monumentation numbered, noted and described? .....	<input type="checkbox"/>	
11. Is stationing shown at centerline – sectional line inter.s? .....	<input type="checkbox"/>	



Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
 R/W Tracs No. «RW Tracs No»  
 Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

## R/W Plans Section – Results of Survey Review Checklist

12. Are ALL points numbered (sec.cor.s, r/w cor.'s, cl.pts, RP's, PI's, Inter.pts.)? ☐ \_\_\_\_\_
13. Are all point number coordinates shown in a table? ☐ \_\_\_\_\_
14. Are NGS and/or ADOT control points shown, w/ co'ods and desc.'s? ☐ \_\_\_\_\_
15. Are all coordinates listed to at least 5 decimal places? ☐ \_\_\_\_\_
- 16a. Are found corners of adjoining subdivisions and properties shown? ☐ \_\_\_\_\_
- 16b. Are adjoining subdivision boundary lines and recording info. shown? ☐ \_\_\_\_\_
17. Are all ADOT standard notes for Results of Surveys shown? ☐ \_\_\_\_\_
18. Are City, County, or Governmental boundaries graphically shown? ☐ \_\_\_\_\_
19. Appropriate references on each sheet to identify the correct sheet(s) containing any details? ☐ \_\_\_\_\_
20. Is there a legend for any non-standard symbols and/or abbreviations? ☐ \_\_\_\_\_
21. Is there a note(s) stating what the basis of the stationing is? ☐ \_\_\_\_\_  
 When applicable, is there a basis of station note after each station equation?
22. Is there a listing/table of all recorded and unrecorded surveys, maps, plats, etc., used in the preparation of the Survey? ☐ \_\_\_\_\_
23. Are major street names shown? ☐ \_\_\_\_\_
24. Are the primary survey control points (like NGS) listed, and have both grid and ground coordinates listed? ☐ \_\_\_\_\_
25. If required in the scope, is side street monumentation shown? ☐ \_\_\_\_\_
26. Is the existing r/w line table correct? ☐ \_\_\_\_\_
27. Has the GAF been listed and checked? ☐ \_\_\_\_\_
28. If available, has the existing right of way been checked against the vesting documents in the existing r/w report? ☐ \_\_\_\_\_
29. Are all existing permanent ADOT easements shown? ☐ \_\_\_\_\_
30. Are Match Lines correct? ☐ \_\_\_\_\_

\_\_\_\_\_  
 Consultant or Plans Reviewer

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Review No.

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
 R/W Tracs No. «RW Tracs No»  
 Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

R/W Plans Section – Phase \_\_\_\_% Review Checklist

	YES	NO	NOT AVAIL.	NOT APPLIC.
<b>I. Face Sheet</b>				
A. Standard Symbols				
1. Is Project Location correctly shown on State Map Insert? .....	<input type="checkbox"/>	<input type="checkbox"/>		
2. Highway name shown correctly (Top Center)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
3. Section name shown correctly (Top Center)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
4. R/W TRACS number (Top Center)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
5. Federal Project number (Top Center)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
6. Project length (Top Center)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
7. District (Top Center)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
8. Drawing number correct (Lower Right)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
9. North arrow properly oriented? .....	<input type="checkbox"/>	<input type="checkbox"/>		
10. Resolution Number and Date Added? .....	<input type="checkbox"/>	<input type="checkbox"/>		
B. Location Drawing				
1. R/W TRACS number and limits shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		
2. Is R/W Map number shown correctly on contiguous projects? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Highway location properly shown? .....	<input type="checkbox"/>	<input type="checkbox"/>		
4. Township, Range and Section lines compatible with glo plats? .....	<input type="checkbox"/>	<input type="checkbox"/>		
5. Major governmental boundaries and names shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		
6. Beginning and ending Mileposts shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
7. Significant Landmarks/Topo shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>II. Title Block (All sheets except Face)</b>				
A. General				
1. Highway Name? .....	<input type="checkbox"/>	<input type="checkbox"/>		
2. R/W Federal I.D. number? .....	<input type="checkbox"/>	<input type="checkbox"/>		
3. R/W TRACS number? .....	<input type="checkbox"/>	<input type="checkbox"/>		
4. Route number? .....	<input type="checkbox"/>	<input type="checkbox"/>		
5. Section name? .....	<input type="checkbox"/>	<input type="checkbox"/>		
6. Drawing number? .....	<input type="checkbox"/>	<input type="checkbox"/>		
7. Hard copy (Survey Map Number)? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Sheet numbers? .....	<input type="checkbox"/>	<input type="checkbox"/>		
9. Comments (missing sheet numbers, etc.) .....				
<b>III. Vicinity Map</b>				
A. Standard Symbols				
1. North arrow properly oriented? .....	<input type="checkbox"/>	<input type="checkbox"/>		
2. Township, Range at North arrow correct? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
3. County name at North arrow correct? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
4. Township, Range, Section lines, Government Lots and quarter Sections graphically correct? .....	<input type="checkbox"/>	<input type="checkbox"/>		
5. Township, Range and Section numbering oriented correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
 R/W Tracs No. «RW Tracs No»  
 Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

R/W Plans Section - Phase      % Review Checklist

	YES	NO	NOT AVAIL.	NOT APPLIC.
6. Governmental boundaries and names shown correctly (County lines, City limits, Forest boundaries, H.E.S., Reservations, recorded subdivisions)				
a. County Lines.....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
b. City Limits .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
c. Forest Boundaries .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
d. H. E. S. ....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
e. Indian/Government Reservations .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
f. Mineral Surveys/Patents.....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
g. Mining Claims.....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
h. Recorded Subdivisions.....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
B. Topography/Alignment				
1. Locations of Highways, major streets, County roads and Railroads shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
2. Rivers /Major washes shown? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
3. Centerline(s) from which R/W is located shown and labeled properly? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Existing R/W shown and labeled correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. New R/W shown and labeled correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		
6. Are permanent Easements (Drainage, etc.) shown and labeled correctly?.....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
7. Is centerline stationing shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		
C. General				
1. Beginning and ending Stationing shown correctly for New R/W project? .....	<input type="checkbox"/>	<input type="checkbox"/>		
2. Beginning and ending Stationing shown correctly for Construction projects? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
3. Is R/W TRACS number shown correctly on NEW R/W project (two places)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
4. Is R/W Federal I.D. number shown correctly on NEW R/W (two places).....	<input type="checkbox"/>	<input type="checkbox"/>		
5. Is R/W TRACS number shown correctly on contiguous projects? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
6. Is R/W Federal I.D. number shown correctly on contiguous projects? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
7. Is Construction TRACS number shown correctly on current project(s) (two places)? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
8. Is Construction Federal I.D. shown correctly on current projects (two places)? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
9. Is Construction Tracs Number shown correctly on contiguous projects (two places)? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
10. Is Construction Federal I.D. number shown correctly on contiguous projects (two places)? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
11. Are sheet outlines shown? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
 R/W Tracs No. «RW Tracs No»  
 Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

R/W Plans Section - Phase      % Review Checklist

	YES	NO	NOT AVAIL.	NOT APPLIC.
13. Are sheet numbers correct on each sheet? .....	<input type="checkbox"/>	<input type="checkbox"/>		
14. Are DGN file numbers correct on each sheet? .....	<input type="checkbox"/>	<input type="checkbox"/>		
15. Are distances to nearest Town/City shown? .....	<input type="checkbox"/>	<input type="checkbox"/>		
16. Are the distances in Kilometers and Miles .....	<input type="checkbox"/>	<input type="checkbox"/>		
17. Is scale shown correctly (center bottom)? .....	<input type="checkbox"/>	<input type="checkbox"/>		
18. Match lines for additional V.M. shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

IV. **Construction Plans/Topography**

A. General

	YES	NO	NOT AVAIL.	NOT APPLIC.
1. Construction Plans <u>        </u> 30% <u>        </u> 60% <u>        </u> 90% .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Right of way requirements shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Construction project limits confirmed and shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are slope limits available at this time? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Dimensions between centerline(s) and right of way lines? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Cattle and/or vehicle passes identified? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Existing roadways shown and identified? .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

YES NO COMMENTS

V. **Calculations**

A. General

	YES	NO	COMMENTS
1. Does current survey information compare favorably with As-Built and old R/W Maps? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Are Section Ties shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. R/W Design calculation checked? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. Area calculation sheets for each parcel close mathematically? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
5. Is boundary closure acceptable? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____

VI. **Plan Sheets**

A. General

	YES	NO	COMMENTS
1. Plan sheet match lines agree with adjacent sheets? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Graphically correct with GLO Plats? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. Index to existing R/W filled in correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. Agree with adjacent R/W Projects? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
5. Access Control Required .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
a. If "YES" is it shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____

B. Standard Symbols

	YES	NO	COMMENTS
1. North arrow properly oriented? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Township and Range at North Arrow correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. County name at North Arrow correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. Scale at North Arrow correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
5. Township, Range and Section numbering correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
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R/W Plans Section - Phase      % Review Checklist

	YES	NO	COMMENTS
6. Governmental boundaries and names shown correctly (County lines, City limits, Forest boundaries, H.E.S., Indian Reservations, Recorded Subdivisions, etc.)? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
<b>C. Alignment</b>			
1. Information agree with existing adjacent R/W Plans and As-Built? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Does information agree with existing survey information? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. Does curve information agree with Tangent information? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. L. T. B.'s shown on spiral controls? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
<b>D. Topography</b>			
1. Are rivers, streams, washes, etc. shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Is direction of flow shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. Are improvements outside of R/W tied in? (exist. pavement, structures, bridges, turnouts, pipes, etc.).....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. Are Slope Limits shown?.....	<input type="checkbox"/>	<input type="checkbox"/>	_____
5. Are existing roadways identified and shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
6. Are T.C.E.'s shown correctly?.....	<input type="checkbox"/>	<input type="checkbox"/>	_____
<b>E. Dimensioning</b>			
1. Is stationing shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Are offsets shown correctly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. Is existing R/W plotted and dimensioned correctly?.....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. Are distances, bearings, arc length, roadways and L.T.B.'s correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
<b>F. Ownership Data</b>			
1. Are parcel numbers and bubbles shown properly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
2. Property lines conform to current Title information? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
3. Is record information shown where required?.....	<input type="checkbox"/>	<input type="checkbox"/>	_____
4. Property limit arrows and anchors correct for each parcel? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
5. Parcel inserts properly shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
6. Has access to each parcel been verified? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
7. Is access to parcel properly shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
8. Lease limits/mining claims shown properly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
 Highway Name «Highway Name» Dist. «District» County «County»  
 R/W Tracs No. «RW Tracs No»  
 Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

R/W Plans Section - Phase      % Review Checklist

		YES	NO	COMMENTS
<b>VII.</b>	<b><u>Cronoflexes/Aerials</u></b>			
A.	General.....			
	1. Are centerline, R/W, Section lines, etc. correctly shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	2. Have aerial contacts been checked for other pertinent topographic features? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3. Ownership lines favorable with aerial contacts (fences, ditches, roads, etc.)? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
<b>VIII.</b>	<b><u>Ownership Record Sheet</u></b>			
A.	General			
	1. Are owners names properly shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	2. Proper descriptions shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	3. Gross area correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	4. Net area correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	5. Total area correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	6. Proper areas for easements shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	7. Are easement areas properly labeled? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	8. Proper remaining areas correct? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	9. Addition of areas correct for each parcel? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	10. Proper sheet references shown? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____
	11. Lease areas shown properly? .....	<input type="checkbox"/>	<input type="checkbox"/>	_____

Section Name «Section Name» R/W Fed. I.D. No. «RW Federal Id No»  
Highway Name «Highway Name» Dist. «District» County «County»  
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Const. Tracs No. «Const Tracs No» Const. Fed. I.D. No. «Const Fed Id No»

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# CORNER RECOVERY SHEET



Right of Way Plans Section  
205 S. 17th Avenue  
Mail Drop : 612 E  
Phoenix, Arizona 85007

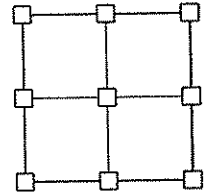
ADOT PROJECT NO: \_\_\_\_\_  
ADOT LOCATION NAME: \_\_\_\_\_  
CONSULTANT FIRM: \_\_\_\_\_  
CONSULTANT PROJ NO: \_\_\_\_\_  
COUNTY: \_\_\_\_\_  
DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
SURVEY ☐ \_\_\_\_\_ ☐ \_\_\_\_\_  
CREW ☐ \_\_\_\_\_ ☐ \_\_\_\_\_

POINT NUMBER: \_\_\_\_\_

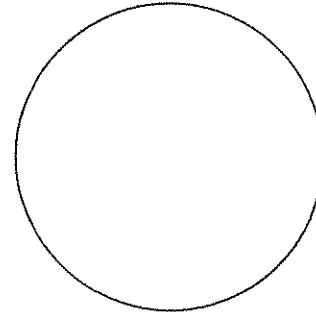
SECTION: \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_

CORNER:

- ☐ NW ☐ N $\frac{1}{4}$  ☐ NE  
☐ W $\frac{1}{4}$  ☐ C $\frac{1}{4}$  ☐ E $\frac{1}{4}$   
☐ SW ☐ S $\frac{1}{4}$  ☐ SE  
☐ OTHER: \_\_\_\_\_



DESCRIPTION: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# \_\_\_\_\_ MONUMENT DETAIL

DIRECTIONS ("GO TO") \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

AREA SKETCH



ADDITIONAL REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Field Book No.:

Page No.:





# Arizona Department of Transportation

## Right of Way Group

### Memo

To: All Right of Way Group Personnel

Date: December 21, 2005

From: Henri C. Verdugo  
Assistant Chief Right of Way Agent  
Right of Way Group

Subject: Temporary Construction Easements  
(TCE's) related to the improvement of  
Turnouts

Per long standing Right of Way Group policy, TCE's are not required for the installation or replacement of cattleguards that are located totally within or along (straddling) ADOT Right of Way lines. Also, TCE's are not required for the installation or replacement of ADOT fencing located within or along (typically immediately inside) ADOT Right of Way lines. Cattleguards and Right of Way fencing are a benefit to both ADOT and to the adjoining land owner(s).

The logic of this policy will now be expanded and applied to the improvement of turnouts. When the turnout improvements will be located totally within ADOT Right of Way, or when the improvements will not extend outside the ADOT Right of Way line, ADOT will no longer require/acquire TCE's for improving these turnouts. As in the case of cattleguards and Right of Way fencing, these turnout improvements are a benefit to the adjacent owner(s).

On the other hand, if improvements or construction activities directly related to a turnout will extend beyond the Right of Way line, a TCE will generally be required.

However:

If this situation occurs on Federal lands (including B.L.M., B.O.R., National Park Service, and Forest Service lands but not including B.I.A. lands) per current procedures, a TCE will be illustrated on the Design plans and will be subject to approval by the FHWA, but the TCE will not be illustrated on the Right of Way plans and will not be acquired by the Right of Way Group.

Additionally, if this situation occurs on a private parcel upon which New R/W will be acquired, per current procedures, a TCE will not be acquired by the Right of Way Group from that particular parcel for the turnout improvements but the temporary rights needed will be acquired by the Right of Way Group through the Right of Way Purchase Agreement of that parcel.

Please refer to the attached drawing for examples of when a TCE will or will not be required for turnout improvements.

NO TCE FOR TURNOUT

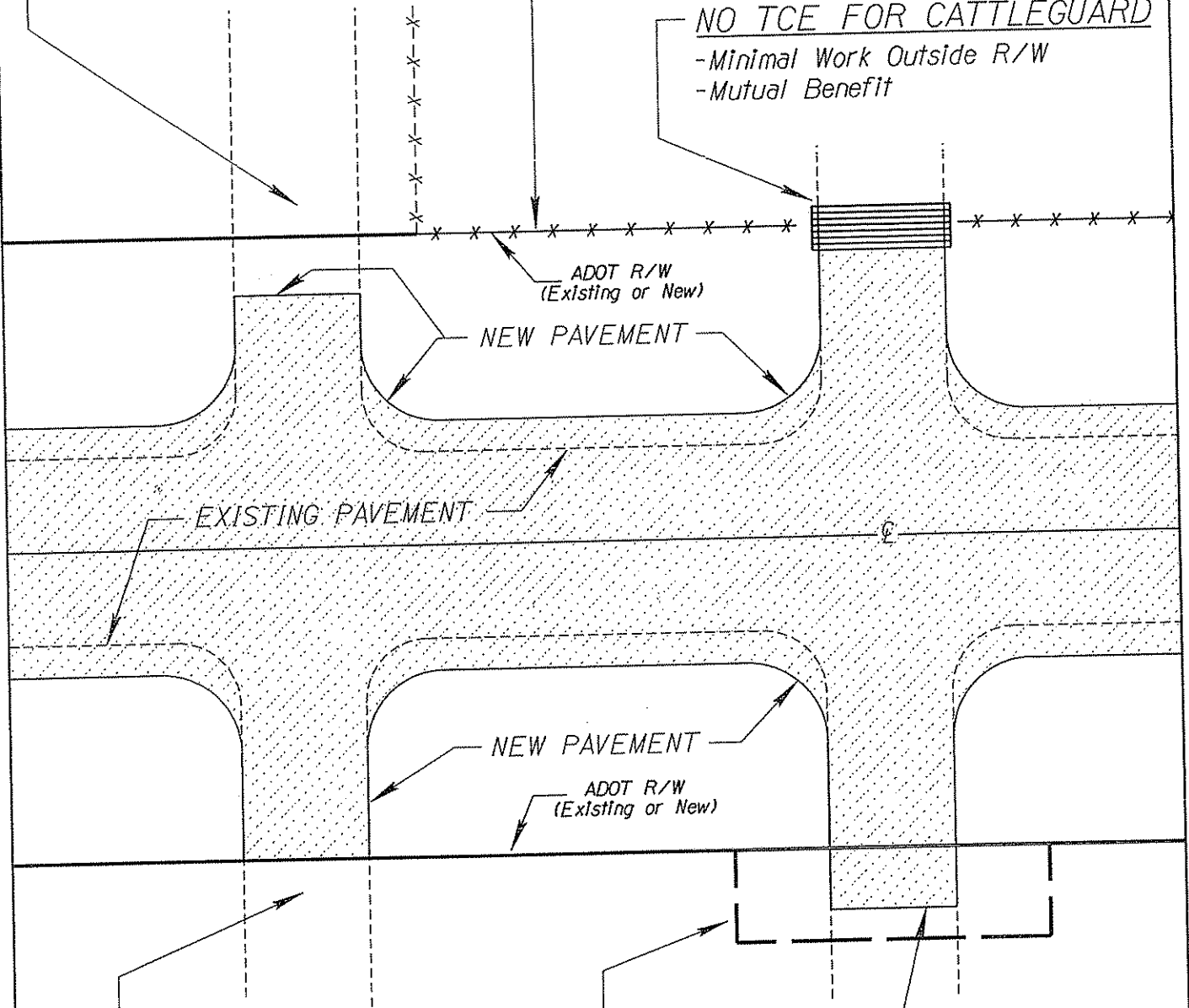
- No Work Outside R/W
- Benefit to Adjacent Owner

NO TCE FOR FENCING

- No Work Outside R/W
- Mutual Benefit

NO TCE FOR CATTLEGUARD

- Minimal Work Outside R/W
- Mutual Benefit



NO TCE FOR TURNOUT

- No Work Outside R/W
- Benefit to Adjacent Owner

TCE REQUIRED FOR TURNOUT\*

- Work Outside R/W
- Benefit to Adjacent Owner

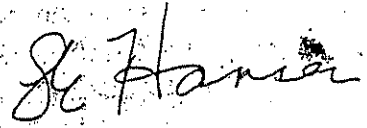
- \* Not If Acquiring New R/W From Same Private Parcel
- \* Not If On Select Federal Land

ARIZONA DEPARTMENT OF TRANSPORTATION  
OFFICE MEMO

March 11, 1998

TO: ALL RIGHT OF WAY PERSONNEL

FROM: STEVE HANSEN, Chief R/W Agent  
Right of Way Group



RE: NEW PROCEDURE FOR ACQUIRING RIGHTS OF TEMPORARY OCCUPANCY

In the past, it has been necessary to acquire Temporary Construction Easements (TCEs) on the Grantor's remaining land for purposes of utility reconnections, driveway reconnections and sound wall construction.

*but do need to show it for a retaining wall*

Effective immediately, a new procedure will be instituted for acquiring these temporary rights through the Right of Way Purchase Agreement. All future Right of Way Purchase Agreements will be modified to contain the following language:

"If the State is acquiring only a portion of Grantor's property, then Grantor grants to the State, its agents, employees and contractors, the right to enter Grantor's remaining property as necessary for utility reconnection, driveway reconnection and to facilitate sound wall construction on adjacent state-owned right of way, if required. The State shall be responsible for any accidents occurring on the property occupied by the State caused by the State's negligent use of the property or by the negligent acts or conduct of its employees, servants or agents during the term of the State's temporary occupancy of the property. It is further understood and agreed that this temporary right will expire and terminate thirty (30) days after completion of the above referenced project."

It will no longer be necessary to show these TCE areas on the R/W plans or prepare TCE documents for these purposes. However, this procedure applies to only those properties where there is a right of way acquisition necessitating executing of the Purchase Agreement. If there is no other right of way acquisition, it will remain necessary to acquire these temporary rights through negotiation of a TCE.

Please incorporate this new procedure into your Section's Policy & Procedure Manual, if appropriate.

SEH/BLE

ARIZONA DEPARTMENT OF TRANSPORTATION  
OFFICE MEMO

March 11, 1998

TO: ALL RIGHT OF WAY PERSONNEL

FROM: STEVE HANSEN, Chief R/W Agent  
Right of Way Group

RE: PROCESS IMPROVEMENT AFFECTING DISTRICT DRIVEWAY PERMITS  
AND ACQUISITION OF TEMPORARY CONSTRUCTION EASEMENTS

In the past, when an ADOT highway improvement project requires reconstruction of existing driveways, it has been necessary to acquire Temporary Construction Easements (TCEs) on areas outside the State's right of way for purposes of making these driveway reconnections. Through joint efforts of the Right of Way Group and the Kingman District, a new procedure for acquiring these temporary rights through the District's permitting process will be tested as a pilot project, with plans for future statewide implementation.

Effective immediately, the "Application For Permit To Use State Highway Right of Way" in the Kingman District will be modified to contain language which grants ADOT the right of temporary access to accomplish driveway reconnects (see attached copy). This permit has been prepared in recordable format so that, upon execution, it can be recorded providing constructive notice of ADOT's existing and future right to make these driveway reconnections.

This new procedure has an immediate impact on the current highway widening project for State Route 95 (Courtwright-Valencia). The Right of Way Group has already supplied the District with a list of the owners and addresses of affected properties. The Kingman District Permits Supervisor will send a revised permit to each property owner for their completion and return. The completed permits will be sent to the Mohave County Recorder's Office for recordation. The reconnection of the driveways will be completed as usual as part of ADOT's construction contract for this project.

As stated in the revised permit language, it will remain necessary to show these areas of temporary occupancy on the construction plans. However, it will no longer be necessary to show TCEs for driveway reconnects on the R/W plans or to prepare TCE documents for this purpose. It will still be necessary to show the TCEs for the reconstruction of the agricultural service roads on this project and to prepare and negotiate the appropriate TCE documents for these areas.

SEH/BLE

Attachment

cc: Debra Brisk  
Dee Goodwin  
Rolly Simeon

## *Design Projects Requiring Only* **TEMPORARY CONSTRUCTION EASEMENTS**

Design projects requiring only Temporary Construction Easements (T.C.E.'s) and not requiring New R/W or permanent easements do not require new Right of Way plans or Change Orders.

The new T.C.E.'s required can be shown on copies of various types of existing drawings, such as R/W plans, R/W strip maps, Design plans, and County Assessor's plats, i.e. The drawings chosen for use must properly illustrate the new T.C.E.(s) and ownerships affected while requiring the fewest amount of additions and/or revisions to the drawings themselves.

After T.C.E. requirements are received by the Right of Way Plans Section, the technician assigned to the project must do the following:

1. Monitor the project in the "Active Projects" database.
2. Order Title information (Vesting Instruments)  
for the affected parcel(s). (Using the Construction Project No.)
3. Determine what type of drawings will be used to show the T.C.E.'s.

After receipt of the requested Vesting Instruments, with parcel numbers assigned, the technician must submit the completed drawings and a copy of the Vesting Instruments to the Right of Way Plans Section Delineation Unit for preparation of the delineation packages. However, before submittal, the technician must ensure the following applicable information is properly shown on the drawings:

1. Parcel bubbles with parcel numbers
2. Owner(s) name, shown adjacent to parcel bubbles
3. Ownership boundaries, with anchors and arrows, if applicable
4. Section, Township and Range information,  
including G.L.O. Lots, 1/4 1/4 callouts, and lines, if applicable
5. North arrow, County, and drawing scale
6. Subdivision information, if applicable
7. Station location, dimensions, and callout for New T.C.E.,  
(with Year, if shown on existing R/W plans or strip maps)
8. Area of T.C.E.(s) within each parcel  
(Shown adjacent to the parcel bubble and the owner's name)
9. Note referring to the New Construction Project  
(if drawings used are not Design Plans)

**Note:**

The above procedures will not apply to Design projects requiring only T.C.E.'s from National Forest lands. These T.C.E.'s will be acquired by Roadside Development, using the new Design plans. A parcel number will not be assigned and the Right of Way Plans technician will only be responsible for confirming that the affected ownership is forest land.

ARIZONA DEPARTMENT OF TRANSPORTATION

OFFICE MEMO

DATE: November 6, 1990

**RECEIVED**

NOV 13 1990

TO: ROBERT HELMANDOLLAR *R.H.*  
Chief Right of Way Agent

DEPUTY STATE ENGINEER  
HIGHWAY DEVELOPMENT

FROM: PETER L. ENO, Manager  
Right of Way Plans Services

RE: Construction Projects Requiring Only a Temporary Construction  
Easement from Various Federal Agencies

As a result of discussions with Jim Hansher and Frank Barba of Acquisition Services and with Carwin Gardner of Operations Services and Gary Goodwin of the F.H.W.A., it has been determined that Right of Way Section will develop new procedures for acquiring TCE's from federal agencies (B.L.M., B.O.R., National Park Service, Forest Service).

Construction plan sheets can be used for acquisition in these instances, with only a minimum of additional information supplied by R/W Plans Services.

R/W Plans does not need to prepare a full set of plans, a detail sheet or a plat, as we have done in the past.

All that Acquisition Services needs in order to make application and to secure a TCE is the following:

1. Construction plans clearly showing the area of involvement.
2. A general legal description of the location of the TCE. Section, township, and range are sufficient.
3. A north arrow.
4. A parcel number will be assigned for all federal agencies except for the forest service. This is needed by Operations Services for tracking the parcel internally through R/W. The forest projects will be handled by Roadside Development.
5. A brief written explanation of the nature of the project and the need for the TCE. A project assessment or a design concept report, etc. will suffice. Acquisition Services requires this information when they make application for the TCE.
6. The approximate area of the TCE. The area is needed by Acquisition Services when they make application for the TCE.

Robert Helmandollar  
November 6, 1990  
Page 2

As mentioned previously, parcel numbers will not be needed for TCE's on forest lands. As part of the standard distribution of construction plans, all projects involving forest lands are sent to Ed Corral of Roadside Development. Mr. Corral sends a set of these plans to the forest, along with a letter requesting their approval of the plans, including the TCE(s). Upon receipt of written approval from the Forest Service, Mr. Corral then forwards a copy to R/W Section for project clearance. Since the approval for the project is obtained by Roadside Development and not by Acquisition Services, a parcel number is not needed by Operations Services to do internal tracking.

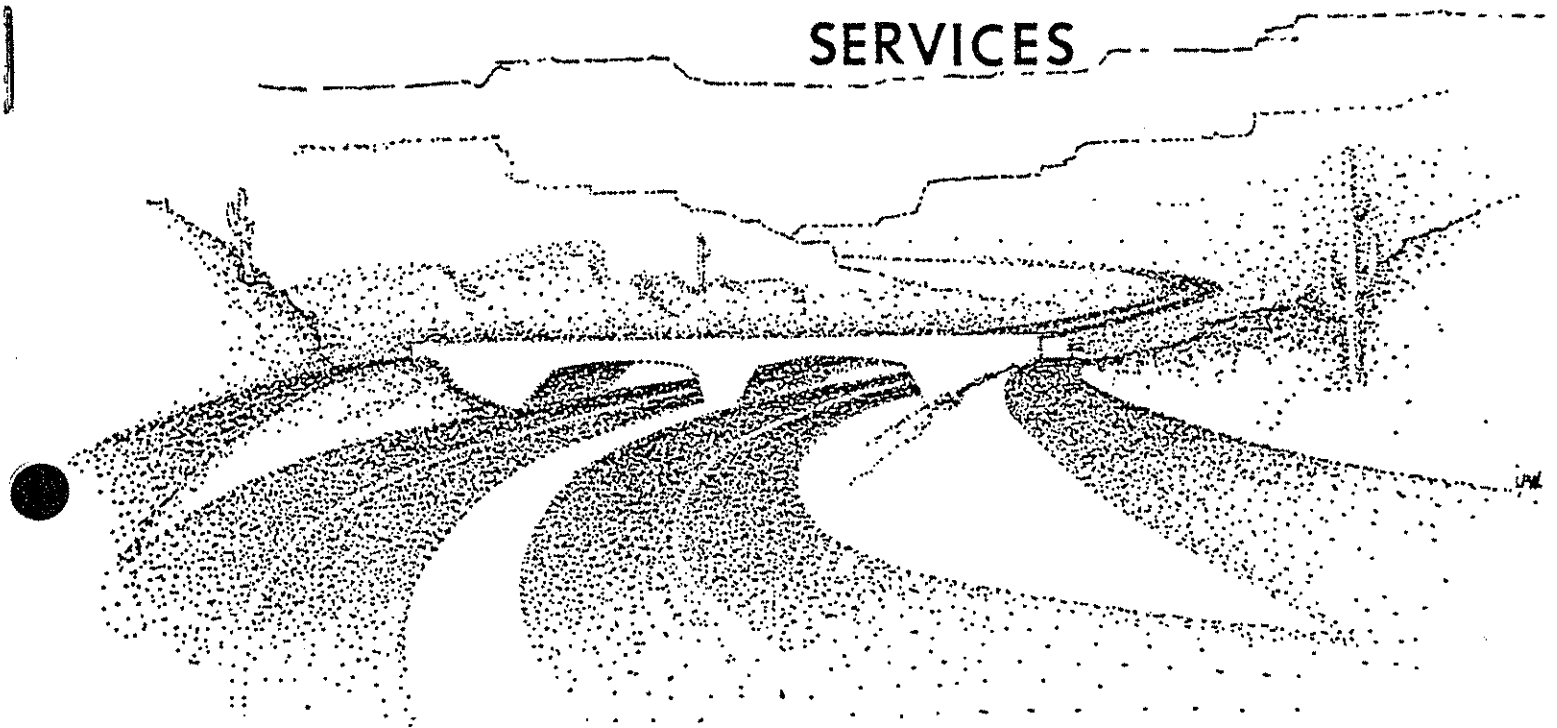
Changing the procedures as outlined will benefit R/W Section as a whole and more specifically, will benefit R/W Plans Services a great deal. Not having to do plans, detail sheets or plats for these TCEs will allow R/W Plans Services more time to do the considerable balance of our workload.

  
\_\_\_\_\_  
PETER L. ENO, Manager  
Right of Way Plans Services

PLE:sgc  
2018E

ARIZONA DEPARTMENT  
OF TRANSPORTATION —  
RIGHT OF WAY SECTION

RIGHT OF WAY PLANS  
SERVICES



**1986**

STANDARDS  
FOR  
RIGHT OF WAY PLANS  
AND  
LEGAL DESCRIPTIONS



### 23.01 PURPOSE

The purpose of this chapter is to describe procedures and standards which will generally apply to the preparation of right of way plans. It should, however, be understood that at certain times deviations from these procedures may be necessary. When deviations are necessary, the Right of Way Plans Services Manager or Assistant Manager shall outline the course of action to be taken.

### 23.02 DEFINITION AND CONTENT OF RIGHT OF WAY PLANS

Approved Right of Way Plans are official documents for use in the acquisition of property and property rights, including access rights, which are to be acquired for right of way purposes. Right of Way Plans shall consist of a title sheet (face sheet), ownership record sheet, vicinity map, and one or more plans sheets. Right of Way Plans may be supplemented by auxiliary detail sheets, special applications sheets, and aerial enlargement sheets, as required.

### 23.03 SOURCES OF RIGHT OF WAY PLANS DATA

Necessary data required in the preparation of the Right of Way Plans shall be obtained from one or more of the following sources:

- (1) field survey books,
- (2) location maps,
- (3) construction plans
- (4) contour maps,
- (5) existing right of way maps,
- (6) title reports,
- (7) city quarter section maps,
- (8) railroad maps,
- (9) county maps,
- (10) subdivision plats,
- (11) assessors plats, or

(12) other sources.

#### 23.04 LINES, SYMBOLS AND ABBREVIATIONS

Lines, symbols, and abbreviations shall be prepared on all sheets as shown on see Exhibits 23-1 and 23-2. Line weights and line lengths shall be as shown on Exhibits 23-1, 23-7 and 23-16.

#### 23.05 ENGINEERING CONSULTANTS' STAMP THEIR PLANS

Plans prepared by engineering consultants shall be stamped in the top right corner of each sheet with the Registered Land Surveyor's Seal.

#### 23.06 FHWA STANDARDS OBSERVED ON FEDERAL-AID PROJECTS

The Right of Way Plans on Federal-Aid projects shall be prepared in accordance with paragraph 4-d of the Federal Highway Administration Federal-Aid Highway Program Manual, Volume 6, Chapter 3, Section 3, Subsection 1, which reads:

##### Right of Way Plans

(1) Right of way plans should show:

- (a) right of way and access control lines,
- (b) width to be acquired,
- (c) proposed slope limits,
- (d) centerline and stationing with appropriate ties to intersecting property lines and changes in right-of-way widths.
- (e) any additional easement areas, either temporary or permanent, that are required to accommodate intersecting roads and streets, land service, access and temporary roads, drainage areas, material storage areas, slope widening, utilities, railroads, or any other special uses,
- (f) all pertinent data affecting the cost of the right-of-way such as structures, land service or access roads, improvements, drain fields, and fences,

- (g) all approved points of entry to or exit from the traffic lanes, even where the right of way lines and access control lines are coincident,
  - (h) disposition of improvements within the proposed right of way, and
  - (i) for each parcel to be acquired:
    - 1. a parcel identification number,
    - 2. the property ownership lines,
    - 3. the name of the property owners, and
    - 4. the area in square feet or acres of the part to be taken and of each remainder of a partial taking.
- (2) The size, form, and arrangement of right of way plans should conform to the general requirements for highway plans and should contain sufficient dimensional and angular data to permit ready identification and correlation with the legal descriptions of all parcel easements and special use areas that are required by the associated highway project.

#### 23.07 TITLE SHEET

A Title Sheet (See Exhibit 23-3), showing general information pertaining to the complete project, shall be prepared for each project, except special projects of one or two sheets.

- a. The Title Sheet shall be drawn in India ink on standard 22" x 36" prepared sheet.
- b. Lettering shall be made with the aid of a mechanical lettering device and shall be the same style and size of the lettering as on the preprinted title sheet.
- c. The name of the project, project number, highway number, county, district and length of project shall be shown in convenient order in the top center of the sheet.
- d. A state map, with all counties, is shown on the top left corner of the sheet. A star shall be used to show the general location of the project on the state map.

- e. Provision shall be made in the lower right corner of the sheet for the resolution number, date and signatures of the approving state, local, and other officials as required. Separate spaces shall be provided for the date and signature(s) of the appropriate federal official or officials.
- f. An identification block showing the project number, drawing number, Federal Road Division, and sheet number shall be shown in the top right corner of the sheet.
- g. A block shall be provided in the lower left hand corner for Public Hearing and Environmental Impact Statement requirements.
- h. A location drawing with sufficient identifying information so that the project may be easily located on a county or state map shall be placed in the center of the sheet. The scale shall be adequate to show the necessary details as governed by the topography and length of project.
- i. The proposed roadway, grade separations, traffic interchanges and beginning and ending station numbers shall be shown.
- j. Section lines and major boundary lines, such as National Forest boundary lines, Indian reservation boundary lines, county lines and city limit lines shall be shown.
- k. Major streets, roads, railroads, rivers and canals shall be shown.

#### 23.08 OWNERSHIP RECORD SHEET

An Ownership Record Sheet (See Exhibit 23-4), showing the name of owner, brief description of take, and area of each parcel of land affected shall be prepared for each project, except special projects.

- a. The Ownership Record Sheet(s) shall be drawn in India ink on standard 22" x 36" linen tracing sheets.
- b. Lettering shall be clear, open-hand lettering or shall be prepared with the aid of a mechanical lettering device. Lettering shall be in India ink.
- c. An identification block showing project number, drawing number, sheet number, initials of person making drawing

and date completed, shall be shown on the top right of the sheet. The highway, section and county shall be shown on the top left of the sheet.

- d. A revision block with headings for change order number, date, initials of person making revision, and description of revisions shall be shown on the top right of the sheet.
- e. The Ownership Record shall be prepared in uniform order with each parcel number being in numerical sequence. The Ownership Record shall contain the following information:

- (1) Parcel Number: A number shall be assigned to each individual parcel of land affected by the highway. A parcel of land is any tract of land which enjoys all of the following:

- (a) Unity of title
    - (b) Unity of use
    - (c) Physical contiguity

Each section of State land shall be shown as a separate parcel on interstate projects only.

- (2) Owner: The name of the owner of each parcel shall be shown. On leased lands, the prime fee owner and the prime leaseholder shall be shown, except on lands under the jurisdiction of the Bureau of Land Management. Only commercial leases need be shown for land lying within a National Forest. Leases shall be designated by "L" numbers. Where there is more than one owner, on either the fee or leasehold interest, the designation listed below shall follow the prime owner's name.

- (a) et al - and others
    - (b) et ux - and wife
    - (c) et vir - and husband

- (3) Description: A brief description of that part of the parcel traversed by the highway shall be shown.

- (4) Total Area: The total area within the boundaries of the parcel shall be shown and shall include all contiguous fee ownership of the parcel. The area

shall be shown in acres, unless the parcel is within an urban area or a subdivision or so small that a fractional part of an acre would be deceiving. The area of a parcel in these cases shall be shown in square feet. A total area is not required for B.L.M., Indian or National Forest lands.

- (5) Gross Area: The gross area column shall show the new right of way plus that portion of the existing public right of way that lies within the limits of the required right of way, providing that the existing right of way is covered by only an easement and, therefore, the underlying fee to the existing right of way is vested in the adjoining parcel of land. If the existing right of way is covered by a deed, thereby vesting the fee ownership to the right of way in the state, it shall not be shown as part of the gross area. If the only area required is new right of way, then it shall not be necessary to designate a gross area. Exhibit 23-5 shows the various methods of designating the areas.
- (6) Net Area: The area of the new or additional right of way shall be shown. The net area is the area to be acquired as new right of way and does not include existing easements for public use. The area of take shall be rounded upward to the nearest hundredth of an acre, except when the area of take is calculated from scaled or approximate data. This area shall be rounded up to the nearest tenth of an acre. Any number reflecting a 3 or larger in the hundredths column shall be increased to the next tenth. Examples are as follows:

(a) 4.23 round to 4.3

(b) 3.12 round to 3.1

The area of take within a subdivision or urban area shall be shown in square feet. Areas smaller than 0.1 acre shall be shown in square feet.

- (7) Easement Area: The area of each type easement, both permanent and temporary, shall be shown. The area of each type easement shall be shown on a separate line and the following abbreviations shall be used to differentiate the different types of easements:

- (a) D.E. - Drainage Easement: A perpetual easement which gives the grantee the right to construct and maintain ditches and dykes necessary to direct the flow of water.
  - (b) S.E. - Slope Easement: A perpetual easement for the purpose of locating, constructing, repairing and maintaining highway slopes in excavation or embankments. The instrument contains a reversionary clause which provides that, if the grantor excavates or places an embankment on the easement area to the grade level of the abutting highway, then the easement rights shall automatically terminate.
  - (c) T.C.E. - Temporary Construction Easement: An exclusive easement for use by agents, contractors, and the traveling public under the state's direction for vehicles maintenance, construction machinery, job storage, office or other necessary uses in connection with the construction of the highway and is usually for a specified period of time.
  - (d) F.E. - Flowage Easement: A perpetual easement to occasionally overflow, flood and submerge the area designated.
  - (8) Remainder: The area of the parcel remaining after the right of way (new and existing) and the new easement area (except Temporary Construction Easement) has been taken from the total parcel shall be shown. Remainder areas include all areas of the parcel except those encumbered by ADOT right of way or easements. This area shall be shown for both the left and right sides of the highway. Remainders are not required for B.L.M., Indian or National Forest Lands.
  - (9) Sheet Number: A number indicating the sheet or sheets on which the parcel can be located shall be shown.
- f. An acquisition record block shall be shown containing the following headings:
- (1) Board approval
  - (2) Type and date of instrument

## (3) Recording information

(a) Date

(b) Book

(c) Page

The acquisition record shall be completed on or before the finalization stage.

23.09 VICINITY MAP

A vicinity map (See Exhibit 23-6), showing the right of way project and its relationship to the surrounding area, shall be shown for each project, except special projects.

- a. The vicinity map shall be drawn in India ink on standard 22" x 36" linen tracing sheets.
- b. The scale shall be adequate to show the necessary details as governed by the topography and length of project.
- c. Lettering shall be hand lettering or prepared with the aid of a mechanical lettering device. Lettering shall be in India ink with a minimum height of 5/32".
- d. An identification block showing project number, drawing number, sheet number, initials of person making drawing, date completed and scale shall be shown on the top right of the sheet; and the highway, section and county shall be shown at the top left of the sheet.
- e. A revision block with heading for change order number, date, initials of person making revision, and description of revisions shall be shown on the top right of the sheet.
- f. The centerline(s), existing right of way, and new right of way shall be shown. The centerline shall be stationed every five (5) inches and "tic" marks shown every inch.
- g. Centerline tangent bearings and curve data shall be shown for the length of the project.
- h. Names for all interchanges, grade separations, highways, major treets, railroads and county roads shall be shown.



- i. All rivers, county lines, city limit lines, National Forest Limits, Indian Reservation limits, Homestead Entry Surveys, and recorded subdivisions shall be shown.
- j. Section lines, quarter section lines, governmental lot lines, and the township and range lines shall be shown.
- k. If more than one sheet is required for the vicinity map, match lines shall be shown on each sheet.
- l. A dashed outline shall be shown around the area covered by each plan sheet. An appropriate sheet number reference shall be shown for each outline.
- m. The beginning and ending station numbers shall be shown for right of way and construction projects. Contiguous right of way projects shall be shown with respective map numbers.
- n. Highway easements, both permanent and temporary, shall be shown and labeled.
- o. Existing right of way shall be referenced to an "Index to Existing Right of Way". The "Index to Existing Right of Way" table shall contain the following information:
  - (1) Index reference
  - (2) Subdivision
  - (3) Section
  - (4) Township
  - (5) Range
  - (6) Acquired from
  - (7) Type
  - (8) Book
  - (9) Page
  - (10) Width
  - (11) Year
  - (12) Parcel number (original)

23.10 PLAN SHEETS

One or more plan sheets (See Exhibit 23-7), showing a plan of a highway improvement and its relation to adjacent property, and the parcels or portions thereof needed for highway purposes, shall be prepared for each project.

- a. All right of way plan sheets shall be drawn in India ink on standard 22" x 36" linen tracing sheets.
- b. The scale should be 1" = 100'. In areas where details are such that this scale would create confusion, a larger scale of 1" = 50' or 1" = 20' may be used. The scale is normally the same as the roadway plans.
- c. Lettering shall be clear hand lettering in India ink with a minimum height of 5/32".
- d. An identification block showing project number, drawing number, sheet number, initials of person making drawing, date completed and scale shall be shown at the top right of the sheet. The highway, section and county shall be shown at the top left of the sheet.
- e. A revision block with headings for change order number, date, initials of person making revisions, and description of revision shall be shown at the top right of the sheet.
- f. Alignment shall be centered on each of the plan sheets.
- g. Plan sheets shall be drawn with stations running from left to right.
- h. All existing, survey, construction, and ramp centerlines shall be shown. Station numbers shall be shown every fifth station. On ramps or connecting roads which have no bearing on the right of way location, the centerline shall be shown without stations.
- i. Curve data for all curves, including spirals, shall be placed as near as possible to the inside of the curve or spiral to which the data applies. If this is not practicable, a table showing the curve data shall be prepared and proper cross-references established.
- j. Angle points of all right of way lines shall show station numbers and distance right or left of the centerline.

- k. Angle points on the centerline, when there is no curve, shall be shown by the use of a detail as indicated on Exhibit 23-8.
- l. Bearings and distances shall be shown around the perimeter of all permanent and temporary easements. An appropriate note shall be shown indicating the type of easement.
- m. Right of way limits for each interchange shall be shown on one plan sheet, even if this necessitates the incomplete use of the preceeding sheet. If the interchange area requires more space than is available on one sheet, it shall be cross-referenced to the plan sheet on which the balance of the interchange is shown. In some cases, a right of way detail sheet may be required to show the limits of an interchange.
- n. Width of right of way, both new and existing, shall be shown at both ends of each sheet.
- o. All section lines, quarter-section lines, sixteenth lines and governmental lot lines shall be shown. The bearings of all section lines and quarter-section lines shall be shown if such information is available. Section lines and quarter-section lines shall be labeled in the following manner:
  - (1) Lines connecting two found section corners, with no found quarter-section corner in between, shall be labeled "Section Line".
  - (2) Lines connecting a found section corner with an unfound section corner shall be labeled "Assumed Section Line", if the line is used in a legal description and a bearing has been shown. Otherwise, the line is approximate.
  - (3) Lines connecting two unfound section corners shall be labeled "Approximate Section Line".
  - (4) Lines connecting two found or calculated quarter-section corners within the same section shall be labeled "Mid-Section Line".
  - (5) Lines connecting a found or calculated quarter-section corner with an unfound quarter-section corner shall be labeled "Assumed Mid-Section Line".

(6) Lines connecting two unfound quarter-section corners, for which the location cannot be calculated, shall be labeled "Approximate Mid-Section Line".

(7) Lines connecting two found quarter-section corners in adjacent sections with no found section corner in between shall be labeled "Assumed Section Line".

No distance ties shall be calculated along the right of way line to assumed lines or approximate lines.

- p. At all points of intersection of the centerline with an established section line, quarter-section line or sixteenth line, the appropriate station number shall be shown.
- q. All section corners and quarter-section corners shall be shown. Bearings and distance ties shall be shown between the nearest section corner or quarter-section corner and the right of way centerline at points of intersection. Corners which are off the sheet, but are used as a tie, shall be shown by the use of a break line.
- r. The toe of slope or top of cut shall be shown and labeled "slope limit".
- s. On projects where the access rights have been or are to be acquired, the access control lines and all approved points of entry to or exit from the traffic lanes shall be shown. If locked gates are provided for entry to or exit from the traffic lanes, a note stating that the gate is a "locked gate", and the name of the person or company authorized to use the gate, shall be placed on the sheet near the gate.
- t. The direction of travel on through lanes, frontage roads, and ramps shall be shown on each sheet.
- u. A number shall be assigned to each parcel of land and each lease affected by the highway. See paragraph 23.08 for details of assigning parcel numbers and lease numbers.
- v. Each ownership affected by the highway, except lands belonging to a governmental agency or railroad, shall be shown in its entirety. Parcels which have an area that is too large to show shall be drawn at a smaller scale in an insert.

- w. Property anchor bars, property limit arrows, and lease limit arrows shall be placed in their appropriate location.
- x. Whenever possible, bearings and distances, from a survey or calculated, shall be shown on the perimeter of each take.
- y. Encumbrances, such as utility and roadway easements, affected by the highway right of way shall be shown. Easement width, easement holder, and recording data shall be shown.
- z. All streets, roads, and railroads shall be shown and labeled to show the name and width. Exhibit 23-9 shows the right of way design for various types of railroad crossings.
- aa. Recorded subdivisions which are affected by the right of way, or are in reasonable proximity thereto, shall be shown. The title of the subdivision, recording information, the block numbers, the lot numbers, widths of alleys or easements, and widths and names of streets shall be shown.
- bb. Existing private driveways shall be shown by a dashed line drawn freehand.
- cc. Improvements affected by the highway right of way shall be shown.
- dd. Any improvement lying outside of, but within 100 feet (50 feet on 1" = 50 feet, 20 feet on 1" = 20 feet, etc.) of any right of way line shall be tied to either the right of way line or the centerline by showing the station number and right-angle or radial distance from that line to the closest point of the improvement. The improvements shall be labeled to show type (house, barn, garage, etc.).
- ee. Private utility or sewage lines shall be shown.
- ff. New and existing drainage features and drainage structures shall be shown by an arrow indicating the direction of flow. Drainage structures 36" and larger shall be labeled to indicate size. Structures smaller than 36" shall be shown but not labeled.
- gg. Trees shall be shown. A group of trees may be indicated by the symbol for trees around the perimeter of such an area and labeled appropriately.

- hh. Match lines shall be shown on each sheet. Match lines shall be placed at even station numbers and shall be labeled "match lines" and shall show the station number. Match lines shall be drawn perpendicular or radially to the centerline.

### 23.11 DETAIL SHEETS

One or more of the following types of detail sheets may be required:

Advance Acquisition Detail, Right of Way Detail, Railroad Detail, Special Survey Detail, Condemnation Detail, B.I.A. Application, Aerial Easement Detail

- a. Advance Acquisition Detail Sheet (Exhibit 23-10): When a parcel of land is to be acquired prior to the completion of the right of way plans, a special drawing shall be prepared showing the information required for appraisal and acquisition. In most cases, this information can best be shown by the use of a plat. On projects where the right of way plans are nearing completion, the Right of Way Plans Manager may require that an Advanced Acquisition Detail Sheet be prepared. Upon completion of the right of way plans, this detail sheet will become a permanent part of the right of way plans.
- (1) Advance acquisition detail sheets shall be drawn in India ink on standard 22" x 36" mylar or linen tracing sheets. The scale shall be adequate to show the necessary details as governed by the topography and size of the parcel.
  - (2) Lettering shall be clear, hand lettering in India ink with a minimum height of 5/32".
  - (3) A note showing the authorization for advanced acquisition shall be shown on the bottom right of the sheet.
  - (4) Provision shall be made in the lower right corner of the sheet for the resolution number and the date and signatures of the approving state, local or other officials as required.
  - (5) An identification block showing project number, drawing number, sheet number, initials of person making drawing, date completed and scale shall be

shown on the top right of the sheet. The highway, section and county shall be shown on the top left of the sheet.

- (6) A revision block with headings for change order number, date, initials of person making revision, and description of revisions shall be shown on the top right of the sheet.
  - (7) An ownership record, prepared as outlined in paragraph 23.08, shall be placed at the top center of the sheet.
  - (8) An index to existing right of way block shall be shown containing the following information:
    - (a) Index reference
    - (b) Subdivision
    - (c) Section
    - (d) Township
    - (e) Range
    - (f) Acquired from
    - (g) Type
    - (h) Book
    - (i) Page
    - (j) Width
    - (k) Year
    - (l) Parcel number (original)
  - (9) The parcel to be acquired shall be shown as outlined in these specifications.
  - (10) The Right of Way Plans Manager may, at his discretion, require additional information such as aerial photograph inserts and a typical section of the proposed roadway.
- b. Right of Way Detail Sheet (Exhibit 23-11): Any area which, because of existing topography or proposed

f. BIA Application Sheet (Exhibit 23-15):

- (1) A BIA Application Sheet shall be prepared for each project that affects lands under the jurisdiction of the Bureau of Indian Affairs.
- (2) The application sheet shall be prepared in India ink on standard pre-printed sheets.
- (3) Lettering shall be made with the use of a mechanical lettering device and shall be the same style and size of the lettering on the pre-printed sheet.
- (4) An identification block showing project number, drawing number, sheet number, initials of person making drawing, date completed and scale shall be shown on the top right of the sheet. The highway, section and county shall be shown on the top left of the sheet.
- (5) In the "Engineer's Affidavit" the name of the Chief Deputy State Engineer, the length of right of way, and the beginning and ending station numbers shall be shown.
- (6) In the "Applicant's Certificate" the name of the State Engineer, the name of the Chief Deputy State Engineer, the length of right of way and the beginning and ending station numbers shall be shown.
- (7) The name and location of the Indian agency office shall be shown.
- (8) A brief description of the right of way being applied for shall be shown.
- (9) An information block showing the allotment number, parcel number, description of that part of the parcel traversed by the highway, area required, and the plan sheet number on which the parcel appears shall be shown.

23.12 AERIAL ENLARGEMENT SHEETS

- a. Aerial Enlargement Sheets (Exhibit 23-16) shall be prepared by enlarging aerial photographs and plotting the alignment in India ink on standard 22" x 36" mylar.



4. Generally, unity of use can be determined from the instruments of record, (such as leases), and aerial photographs. If all the facts as to unity of use are not determined during the development of the right of way plans, any difference will be noted by the Right of Way Appraiser during the property examination and submitted to the Titles Section for revisions.
5. Physical contiguity can be best determined from the recorded instruments.
6. An exception to the procedure is State Land. On all Secondary and Primary projects, only one parcel number shall be assigned to all State Land traversed by the project. On Interstate Highway projects, a separate number for each section of State Land shall be assigned.
7. After all parcels in a project have been assigned a number and entered in the Section's parcel numbering *file*, the appropriate assigned number shall be placed on the cover page of all copies of the title report.

**D. ADDITIONAL LAND ACQUISITION DESIGNATION**

If the acquisition of additional land from a given parcel is necessary after the original negotiations are completed and instruments are recorded, but prior to the completion of the construction contract, and the property still qualifies as a parcel under the same original ownership, the new acquisition and related documents shall contain the prime (original) parcel number with a suffix letter.

- a. The first request for additional land from the original parcel will use the letter "A". For example, if the original parcel number was 7-132, then the parcel number to be issued for the first additional acquisition would be 7-132-A.
- b. Subsequent requests will use the next letter in order. For example, the second additional acquisition within the parcel designated as 7-132 would be 7-132-B.
- b. After the parcel numbers have been assigned to a project and a change in the ownership concerning one or more parcels reveals that other or additional parcels of land are affected by the project, a completely new number shall be assigned to the area or parcel.